

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

PUBLISHED MONTHLY BY THE MINNESOTA STATE MEDICAL ASSOCIATION

Volume XV
Number 2

FEBRUARY, 1932

25 cents a copy
\$3.00 a year

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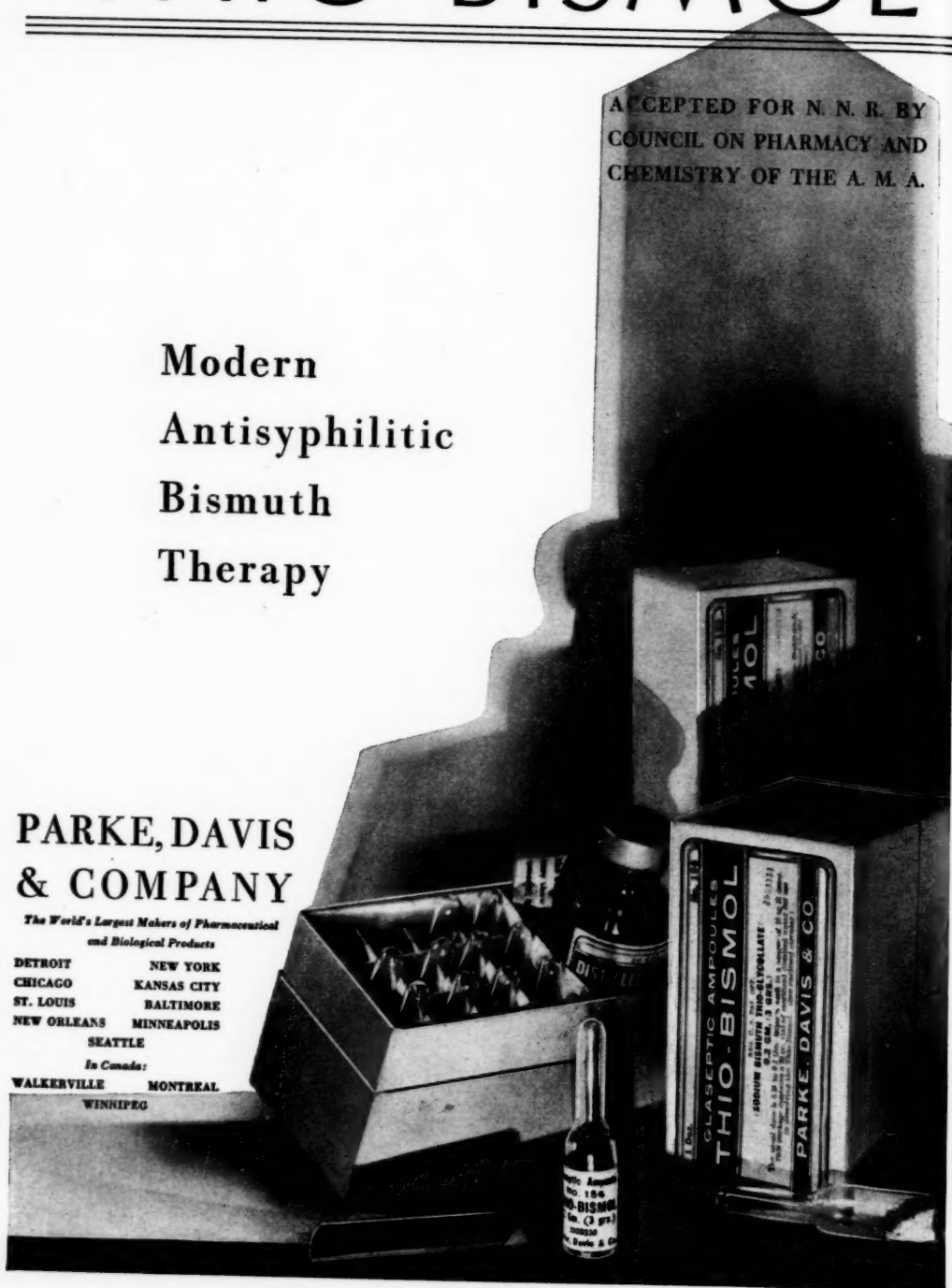
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LUMBAR ANESTHESIA—RÉSUMÉ OF 751 CASES*

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Mankato, Minnesota

WE find that our patients are much less apprehensive when we refer to "lumbar" instead of "spinal" anesthesia. A more correct term would be spinal subarachnoid block instead of subdural or intradural anesthesia as it is so often wrongly termed in our literature. Placing the anesthetizing drug under the dura instead of under the arachnoid membrane is a frequent cause of failure in obtaining a good anesthesia.

Lumbar anesthesia was first discovered by J. P. Corning in 1885, when he accidentally punctured the spinal membranes while injecting cocaine into the spinal region to control pain. Bier and Hildebrand in 1898 had the courage to demonstrate upon themselves. They injected .5 c.c. of 1 per cent cocaine solution into the spinal canal of each other. The anesthesia was apparent only in Hildebrand. Failure to obtain anesthesia in Bier was due to a leaky syringe and most of the cocaine solution was lost. Hildebrand described thoroughly the effects of the anesthesia as they developed and then later disappeared. He was quite sick for several days following the injection. Only during the past few years has lumbar anesthesia emerged from its slumbers to take its rightful place among the various methods of anesthesia. The work of Babcock, Labat, Jonnesco, Koster, Evans, Pitkin and others has done much to eradicate our doubts and misgivings and to place lumbar anesthesia on a definite comprehensible basis.

In our series, lumbar anesthesia was induced in the great majority of cases by the so-called "volume speed control method." This method was adopted after trying various other methods,

which had given equally good results in other hands. The novocain or neocain crystals are dissolved in the spinal fluid and this solution is re-injected into the subarachnoid space without barbotage, thus obviating the chance of displacing the needle during such maneuvers. It is probably the most simple and least technical of all methods.

Kirschner has recently devised a method by which he induces a belt anesthesia which is limited to the field of operation. He places the patient in the lateral position with the head down, and after inserting the needle (which has special features) into the spinal canal, he replaces the spinal fluid in the lower part of the canal with air. He then introduces his anesthetizing solution of lesser specific gravity than the spinal fluid and this floats on top of the spinal fluid, causing a localized anesthesia. He has devised a spinal double syringe to facilitate the injection of both air and the anesthetizing solution in varying amounts.

Preoperative medication has varied but usually consists of a sedative the evening before operation, and morphine sulphate, gr. 1/6 by hypodermic with nembutal, grains 3, per os, one hour before operation. This usually allays all nervousness and eradicates any psychic trauma. It is often noticed that a restless patient will become very quiet and go to sleep during a high abdominal anesthesia. Such an effect cannot be attributed to vascular depression as it occurs when the blood pressure has remained normal. This phenomenon may be due to the blocking of adrenal glands through the sympathetic system, or to a high diffusion of the drug to the cerebral cortex.

The dosage of novocain used has varied from

*Read before the Southern Minnesota Medical Association, Faribault, Minnesota, August 24, 1931. Since this paper was written the series of lumbar anesthesia cases has been increased to over 1,000 cases.

50 to 350 mg., and is gauged according to age, weight, general condition of patient, level and duration of anesthesia desired. Ephedrine sulphate is given subcutaneously in doses of 30 to 120 mg., at the puncture site. Although Labat emphatically states that ephedrine should not be used and apparently proves his statement from a theoretical standpoint, practical experience has proven that ephedrine has the desired effects and that it has a definite place in lumbar anesthesia. Ephedrine has a peripheral vasomotor action, especially upon the splanchnic vessels. We have omitted the ephedrine several times and have noticed a greater drop in blood pressure.

Our patients are not immediately placed in the Trendelenburg position, but are kept horizontal for 10 to 12 minutes until the drug becomes fixed. Later they may be placed in the Trendelenburg position if desired for better exposure of the operative field. However, in doing a cholecystectomy it is advantageous to keep the patient in the horizontal position so that the liver can be readily turned down and outward. In case of a sharp drop in blood pressure or evidence of shock, the table is at once tilted into the Trendelenburg position, but the necessity for this

maneuver has been uncommon in our series. Following the operation the foot of the bed is elevated for several hours.

We can usually start the operation five to seven minutes following the injection, but occasionally it is necessary to wait longer. If the anesthesia is not satisfactory or high enough after five minutes we usually lower the head of the table to allow the drug to diffuse higher. This maneuver will be of little value if done after 10 minutes or more.

Table I shows the type of cases and is self-explanatory. It might be said here that most of the poor results were encountered during the early part of the series, and were probably due to faulty technic. At times when the operation has been prolonged over 60 or 70 minutes, it has been necessary to supplement with nitrous oxide-oxygen anesthesia. However, this can be avoided if larger doses of novocain are used.

Table II is a classification of the complications and sequelæ which may follow lumbar anesthesia.

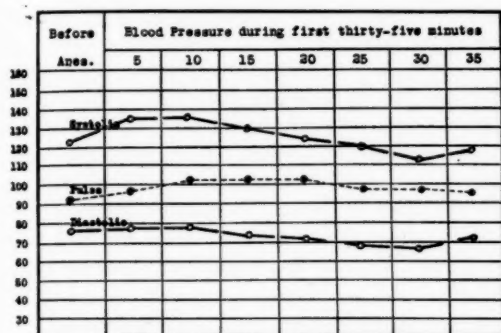
Low blood pressure or vascular depression is due to paralysis of the vasomotor center, especially affecting the great splanchnic pool, which is controlled by nerves from the region of the

TABLE I

TYPE OF OPERATION	LUMBAR ANESTHESIA						
	Number of Cases	Grade of Anesthesia			Supplemental (N ₂ O-O ₂)		
		Good	Fair	Poor	Prolonged Operation	Fair Anesthesia	Poor Anesthesia
Appendectomy	148	143	4	1	0	1	1
Cholecystectomy	104	96	6	2	3	5	2
Pelvic Pathology	84	83	1	0	1	1	0
Abd. Hysterectomy	62	58	4	0	3	3	0
Rectal Pathology	60	60	0	0	0	0	0
Hernioplasty	56	54	2	0	0	2	0
Gastric and Intestinal	35	33	2	0	4	2	0
Prostatectomy	32	31	1	0	0	1	0
Cystoscopy	21	21	0	0	0	0	0
Vag. Hysterectomy	19	19	0	0	2	0	0
Operative Obstetrics	13	13	0	0	0	0	0
Orthopedic	11	11	0	0	0	0	0
Kidney and Ureter	10	10	0	0	0	0	0
Radical Breast	8	7	1	0	1	1	0
Ectopic Gestation	6	6	0	0	0	0	0
Amputation of Leg	6	6	0	0	0	0	0
Cesarean Section	5	5	0	0	0	0	0
Miscellaneous	71	64	4	3	1	2	3
Total	751	720	25	6	15	18	6

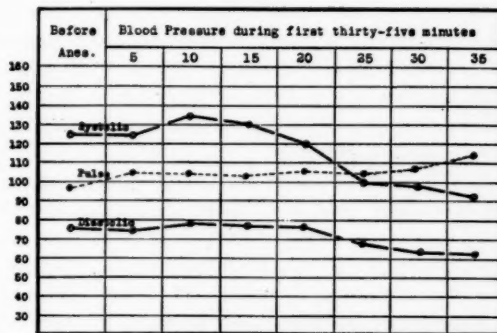
sixth dorsal to the third lumbar vertebra. Therefore practically all these vessels are dilated in anesthesia which extends to the lower chest region. The pulse theoretically is slowed because

Chart II shows the average blood pressure during the first 35 minutes in eight radical breast operations. Here the blood pressure showed a greater drop and the pulse quickened. Large



Average Blood Pressure and Pulse - 100 Cases
Cholecystectomy - Lumbar Anesthesia

Chart I



Average Blood Pressure and Pulse - Eight Cases
Radical Breast Operation - Lumbar Anesthesia

Chart II

of unrestricted vagus action, but personally we have never noticed this marked slowing of the pulse.

Chart I shows the average blood pressure and pulse during 100 cholecystectomies. It is noticeable that the average blood pressure has remained at a very satisfactory level during the time which is considered the most dangerous period after the induction of lumbar anesthesia.

TABLE II.—COMPLICATIONS LUMBAR ANESTHESIA

IMMEDIATE

1. Low Blood Pressure
2. Nausea
3. Pallor—Cold Sweat
4. Respiratory Failure
5. Shock, Syncope, Convulsions

INTERMEDIATE

1. Headache
 - a. Mild
 - b. Severe
2. Backache
3. Bladder Disturbance
4. Meningismus
5. Ocular Manifestations
6. Meningitis

LATE

1. Persistent Headache
2. Nerve Injuries
3. Psychic Disturbances

doses of novocain were used in these cases because of the height of anesthesia desired and the length of time which might be required for completion of the operation. This type of case is greatly benefited by the intravenous injection of normal saline during or immediately after the operation. Larger initial doses of ephedrine may be given, the small initial dose may be supplemented later, or one of adrenalin may be given.

Hypertension cases show a greater drop in blood pressure, which may be due to the fact that ephedrine acting as a peripheral vasoconstrictor has less effect upon sclerotic arteries. Hypotension cases respond very nicely to ephedrine and, at the end of the operation, their blood pressure is often higher than before. We do not hesitate to use lumbar anesthesia because of hypotension unless this is due to a moribund condition or to great general debility.

In observing blood pressure readings it is a common mistake to consider only the systolic or driving force of the heart, and to disregard the diastolic pressure, which represents the tone of the peripheral vasomotor capillary bed. Life is dependent upon the diastolic pressure and when it falls below 40 mm. Hg. the oxygen dissociation curve reaches a point where oxygen is no longer available when the blood reaches the

capillaries. At 60 mm. Hg. (MacLeod), the blood may be nearly saturated with oxygen, whereas at pressures below 50 it readily loses oxygen, and at 10 there is a complete loss of oxygen. It is therefore imperative that we keep up the diastolic pressure.

Nausea in this series has been present but not annoyingly so, and it has been less noticeable during the past few months. At times it seems that overaction of the ephedrine might be the etiologic factor in some cases. We recognize three types of nausea:

1. That due to psychic causes, evident when the patient is allowed to over-indulge in conversation. A few deep breaths usually suffices to stop this type.

2. Nausea due to lowered vascular tension. Treatment of this type is that of the low vascular tension.

3. Reflex nausea due to pulling or tugging of intra-abdominal viscera. This type usually stops as soon as the tugging ceases. Inhalation of oxygen with or without CO₂ is often of value in all three types of nausea.

Pallor or cold sweats are usually the result of mild shock which follows a marked drop in blood pressure. This has been quite infrequent but is a danger signal and calls for immediate action. Placing the patient in the Trendelenburg position usually suffices. It is advisable to have intravenous normal saline available for prompt use, if needed.

Respiratory failure is a greatly feared complication, which has done much to keep lumbar anesthesia from gaining widespread popularity. This much talked of complication has been attributed to the high diffusion of the drug in the spinal canal with its paralyzing action upon the respiratory center. However, it is the consensus of opinion that the dilution of the drug, by the time it reaches the bulbar region, is so great that it is almost impossible to paralyze the respiratory center by injecting the drug in the lower spinal region.

Koster has shown by animal experiments that the medulla is not affected by direct application of a 4 per cent novocain solution. Therefore it seems probable that respiratory failure is a result of bulbar anemia and should be treated as such. In lumbar anesthesia to the nipple line one often notes a slight degree of respiratory depression, such as shallow breathing or the patient may

complain of a sense of constriction across the chest. Careful observation of the patient during the anesthesia is quite essential. We take blood pressure and pulse readings every five minutes and carefully note the patient's color. In fact, by watching the patient's face one can tell almost as much concerning his condition as by taking the blood pressure.

It is difficult to estimate the amount of vascular depression before an anesthetic is given. Often we have encountered a marked drop in blood pressure following a very low spinal tap, and when only 50 mgm. of novocain was injected. This is probably explained as a vasomotor reflex, due to the spinal tap itself. A marked drop of blood pressure is often encountered following a diagnostic spinal puncture.

Shock and syncope may immediately follow a lumbar puncture regardless of whether any drug is injected into the spinal canal. We have never seen such a reaction. Convulsions are possible when the drug is injected directly into one of the venous sinuses, which are plentiful surrounding the vertebræ.

Among the intermediate sequelæ we find that headache is the most frequent. It may vary from a mild type which clears up readily, to a more severe persistent type which requires careful treatment. In this series, headaches have been conspicuous by their infrequency and have usually occurred in patients who were allowed to be up within forty-eight hours following the operation. We recognize two definite types of headache: The mild type caused by reduced intraspinal pressure following leakage of fluid from the site of puncture, and the severe type due to increased intracranial pressure, probably due to irritation of the spinal membranes by the novocain, red blood cells in the spinal fluid caused by trauma, or foreign material entering at the time of injection. The mild type has always responded when the patient was placed in a recumbent position and on three occasions the headache disappeared after giving 0.5 c.c. of surgical pituitrin subcutaneously. Hypotonic solutions intravenously are also indicated in this type of headache. The severe type of headache has been encountered only a few times and has always responded to a hypertonic solution of glucose given intravenously. Spinal drainage may be used if the hypertonic solution does not relieve. Caffein sodium benzoate in 5 grain

doses given intravenously will also markedly reduce the intracranial pressure.

Backache is a common complaint often made by the patient, who naturally believes that the needle inserted into the back is the cause of his pain. As a matter of fact, the majority of patients develop some backache post-operatively regardless of the type of anesthesia. Only a localized aching or pain can be directly attributed to the lumbar puncture. We have had patients complain that their backache is at the point of insertion of the needle, but upon asking them to locate the exact spot, we find it several inches away from the site of puncture. Lumbar anesthesia causes such a complete relaxation of the muscles that it is advisable to place a small hard pillow in the hollow of the back during the operation.

Bladder disturbances have not occurred more often in this series than have been encountered in cases where general inhalation anesthesia has been used.

Meningismus, ocular manifestations, and meningitis have not been encountered.

Late Sequelæ.—Persistent headache is probably due to meningeal irritation with increased intracranial pressure and an increased spinal fluid cell count. Iason, Lederer and Steiner have made studies of the spinal fluid following lumbar anesthesia and have found an increased cell count, and increased sugar reaction, in about 50 per cent of the cases. The headache is usually accompanied by some vertigo, stiffness of the neck muscles and other signs of meningismus. There have been no persistent headaches in this series.

Nerve injuries may be caused by careless lumbar puncture, and may manifest themselves in the form of paresthesia, anesthesia, paresis, sharp shooting pains into the lower extremities, and neurotrophic disturbances. They are, however, infrequent and have caused us very little concern. During lumbar puncture, on several occasions, the patient has complained of a sudden sharp pain shooting into the leg. This evidently was caused by the needle striking a fibre of the cauda equina, but has been of a transient nature.

Psychic disturbances, of which much has been written, have caused us no trouble and probably will not occur if proper pre-operative medication is prescribed.

Morbidity and Mortality.—Morbidity in lumbar anesthesia is certainly minimal. The small

amount of novocain used has very little, if any, effect upon the tissue cells, and the kidneys, liver, brain and lungs show practically no toxic effect from the drug. Pulmonary complications are rare compared to those following inhalation anesthesia. In this series there have been several minor pulmonary infections but no post-operative pneumonias. We have encountered one case of massive pulmonary collapse.

Tendler reviewed 326,910 cases in which lumbar anesthesia was used with eighty deaths. His tabulation includes many different technics and drugs used. There are seven series of cases, totaling 22,365, in which there were no deaths. Tendler remarks that including all cases the mortality is one in 4,086 cases. However, in carefully reviewing these deaths, he finds that the greater number were in cases where approaching death was plainly evident, and death would probably have resulted regardless of the kind of anesthesia induced. In only nine or ten cases of the entire series was it evident that death was caused by the intraspinal injection. There have been no deaths directly resultant from the anesthesia in this series, but I wish to report one case in which the patient died about ten days after operation, of what appeared to be a clinical tetanus.

The patient was thirty-four years old, and was considered a good surgical risk. She was given lumbar anesthesia and reacted normally throughout the operation, which consisted of a colpoperineorrhaphy and a laparotomy for cystic ovaries and retroverted uterus. She convalesced nicely until the evening of the eighth day, when she complained of a headache and some stiffness of the muscles of the neck and jaws. During the night she developed a spasm of the jaws and bit her tongue several times. The next morning there was some stiffness of the masseters, and a slight rigidity of the neck. No Kernig or other abnormal reflex was demonstrated. She complained of some difficulty in swallowing and was quite irritable. Lumbar puncture revealed a clear fluid under slightly increased pressure. Examination of the fluid revealed a low normal cell count and no other abnormalities. That night she developed more stiffness of the jaws and dysphagia was more evident, simulating a hydrophobia. Reflexes at this time were equal but hyperactive. Another lumbar puncture revealed a clear fluid under slightly increased pressure and a normal cell count. Antitetanic treatment was instituted, and she appeared somewhat improved until the next morning. At this time the typical "risus sardonius" was present. She developed tonic spasms of the diaphragm and died during the third spasm. Complete autopsy was refused but we were allowed to cut out the abdominal wound for examination. A cisterna puncture done at this time revealed

another normal spinal fluid cell count. Thinking of a possible tetanus infection from catgut, we excised the abdominal wound and sent it to the laboratory for examination. The report later returned negative for tetanus. Later it occurred to us that we should have taken the perineal wound as well because of the possibility of tetanus infection following perineal and rectal surgery. Tetanus following surgery of this type is mentioned quite frequently in the foreign literature. There was no history of previous injury where the infection might have gained entrance. We do not believe this death can be attributed to the lumbar anesthesia.

Contra-indications for lumbar anesthesia may be grouped as follows:

1. It should not, under any circumstances, be employed in cases presenting involvement of the nervous system, such as brain tumors, meningitis, or intracranial hemorrhage.

2. It should not be used where local infection is present at the site of puncture.

3. Sub-standard risks should not be subjected to this type of anesthesia, except by those who are well trained in its use and who are able to combat any complication which may arise.

4. Grave icteric patients and those with marked cachexia do not stand any sudden change in the vasomotor system, and therefore should not be given lumbar anesthesia. Local infiltration is the method of choice in these cases. We have refused lumbar anesthesia on two occasions and have later seen the patient succumb on the operating table under infiltration anesthesia.

5. Patients in severe shock should not be subjected to lumbar anesthesia until measures have been introduced to raise the vasomotor tone. Patients in shock due to marked hemorrhage react poorly under this type of anesthesia, and are bad risks unless the bleeding is under control and blood transfusion is available. Shock not due to hemorrhage is not to be considered a contra-indication as favorable reactions occur with this method when properly used.

Conclusions.—We believe that lumbar anesthesia in competent hands is the safest and most satisfactory of all forms of anesthesia. Any surgeon who once becomes familiar with its ease of administration and its advantages both to the patient and himself, will never want to go back to other methods. The complete relaxation of the muscles (which is found only in the deep stages of ether anesthesia) and the quiet abdo-

men facilitate rapid and thorough surgery. During the anesthesia it is found that active intestinal peristalsis is present and that the kidneys show an increased urinary secretion. Post-operative complications are fewer, and much less severe than with inhalation anesthesia. Nursing care has been reduced to a minimum due to the lack of post-operative vomiting and abdominal distention. With the advent of newer and better drugs along with new technics, it is possible that a more localized and longer anesthesia may be available in the near future.

In summing up, I might quote Babcock, who says, "When properly employed, no other anesthesia of equal range leaves so few sequelæ."

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ACHLORHYDRIA AND HYPOCHLORHYDRIA IN PEPTIC ULCER*

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THE relationship between peptic ulcer and the acid content of the stomach is complex and has been the basis for many heated arguments between groups of internists and between internists and surgeons. Practically no one believes that hyperacidity *per se* can cause the formation of a peptic ulcer but it is very generally believed that hyperacidity prevents the healing of an ulcer.

Just what are the normal acid values determined with the Ewald test meal? Dr. B. W. Sippy and his successors have made a rough clinical grouping as follows: normal adult free hydrochloric acid ranges from 20 to 40 points; normal total acid values range from 40 to 60 points. Peptic ulcer typically causes higher acid values. This has been a fairly satisfactory standard for duodenal ulcers, though not so well adapted for gastric ulcers, since many gastric ulcers have acidities well within these so-called normal limits. Recently, Vanzant¹ has attempted to establish the normal range of gastric acidity from youth to old age by studying 16,000 records of patients having had gastric analyses. Of these, 3,381 were selected as having no evidence of disease of the gastro-intestinal tract, nor other serious conditions. To these he added data from 365 cases from the literature, in the younger age groups. The test meal used consisted of 8 arrowroot cookies and 400 c.c. of water. If no free HCl was found at the end of an hour, further tests were made each 15 minutes for 45 minutes longer. True achlorhydria was diagnosed only when the fractional test showed no free acid and this was confirmed by histamine injection. The incidence of achlorhydria was found to increase from 4 per cent at 20 years to 26 per cent at 60 years. The one-hour test showed considerably more apparent achlorhydria than was determined with the 1 and three-fourths hour fractional test or histamine injection. He found the typical free acidity in adults to be 35 units in females and 50 units in males. After the age of 50 this sex dif-

ference is reduced till at 65 years the males' free acid dropped to that of the females. He suggests that the three-times greater incidence of ulcer in men than in women may be associated with this decided sex difference in acidity. The total acid for adult females remained at about 51, whereas for males it ranged from 66 at 20 years to 56 after 65 years.

The incidence of hyperacidity and achlorhydria in cases of peptic ulcer has been variously reported. A complete review of the literature will not be attempted here, but reference will be made only to a few of the more complete and more recent studies. Rehfuess² in his book quotes Bell and Hunter as finding 70 per cent hyperacidity and no achlorhydria in duodenal ulcers. He himself found 78 per cent hyperacidity in duodenal ulcer. Moynihan is quoted as reporting 72.7 per cent hyperacidity for duodenal ulcers but only 20.9 per cent for gastric ulcers. The same author reported 13 per cent achlorhydria in gastric ulcers and 5.5 per cent achlorhydria in duodenal ulcers. The fractional method was used in these cases and the lesions were demonstrated at operation. Histamine was not used. Rehfuess states that the incidence of hyperacidity in gastric ulcer is no greater than the high acid values found in an equal number of normals, but the quantity of total acid by volume may be greater, due to a greater rate of secretion. He emphasizes the fact that gastric secretion *per se* does not produce ulcer, but in the presence of focal infection and other factors, it causes an extension and persistence of the lesion.

Brown³ in a review of 1,224 cases of peptic ulcer gives figures showing hyperacidity in 75 per cent, normal values of free acid (20-40) in 22 per cent and below 20 points in only 3 per cent. From personal contact with the figures contained in this review, one of the present writers (J. A. W.) does not know of any case of true achlorhydria in this series. Several cases showed no free acid with an Ewald meal, but a therapeutic or nightly aspiration revealed free acid.

*From the Medical and Surgical Divisions of the Earl Clinic and the Medical Service of Ancker Hospital, St. Paul, Minnesota.

The very high acid values in this series were usually in duodenal rather than gastric ulcers, and many of the gastric ulcers had normal or low free acidity.

Emery and Monroe⁴ in a review of 556 cases of peptic ulcer also reported hyperacidity in 75 per cent and hypoacidity in 9 per cent. They state that patients having symptoms over 20 years had no higher acidity than patients with recent ulcers.

There have been many cases reported in the literature of peptic ulcer in persons with an achlorhydria. However, the number of such cases is not as great as one would be led to suppose, for various careful investigators have shown most of them to be only apparent achlorhydria and to have been incompletely analyzed. Emery and Monroe⁴ in their series found ten cases of ulcer with no free acid reported after an Ewald or a fractional test meal. Of these, one had pernicious anemia and an X-ray diagnosis of ulcer, but no symptoms of ulcer. Several others showed free acid after a meal or a therapeutic aspiration, and others had a very high total acid. They state that "there is no proof that true achylia gastrica occurred in any uncomplicated case in this series." Eusterman⁵ in 1921 described two cases of anacidity following gastro-enterostomy for ulcer where free acid had been present before the operations. In one case, even therapeutic aspirations and Riegel meals yielded no free acid. Food and alkalis relieved the pain, however. In neither case was histamine used as a stimulus. Palmer⁶ has presented a most careful résumé of the literature on achlorhydria and ulcer and has analyzed critically the various cases reported. Several of these were not bona fide cases of ulcer for they died of carcinoma metastases three to five years later. He states that with one exception (Eusterman's case, cited above) these are all unproved achlorhydrias for they are so named on the basis of only one Ewald or Boas meal or a fractional Ewald or Boas meal. Histamine tests and therapeutic aspirations were not tried. He mentions eighteen cases at the Presbyterian Hospital in Chicago where the free acid varied from 0 to 70 points on repeated Ewald tests, which emphasizes the necessity for more than one test meal if no free acid is found. Several of his patients who had no free acid with a fractional test later showed normal values with an Ewald. He an-

alyzed the records of 1,469 ulcer patients at this same hospital and found only seven who never showed any free acid at any time. Four of these were ruled out because only one test meal had been used. Another was later diagnosed as gastric lues at Rochester and proved so at operation by Dean Lewis. Another was ruled out for lack of proof of ulcer (gastro-enterostomy and gastric resection had changed the normal physiology), and the seventh case was found at necropsy to have been that of a healed ulcer, with symptoms due to other causes. Palmer also criticizes a few more cases with which he was familiar from the Mayo Clinic and from the Cook County Hospital, and finds two of these suggestive but not proved cases of achlorhydria. The only case in the literature where test meals and therapeutic aspirations for benign ulcer failed to show free acid is that reported by Eusterman.⁵

When one stops to consider the mechanisms which control the values of gastric acidity in ulcer one naturally thinks of the effect of the obstruction at the pylorus or in the duodenum and its influence in inducing hypersecretion. This undoubtedly is an important factor, but even of more importance are the interesting recent observations of Elman⁷ and of Olch⁸ on the regulation of gastric acidity by duodenal regurgitation. These workers have shown experimentally that the pancreatic juice normally regurgitates into the stomach and thereby neutralizes gastric acidity. If this secretion (pancreatic) is diverted to the exterior of the animal, gastric acid values mount materially and hydrochloric acid meals put into the stomach are neutralized much more slowly, thus delaying emptying of the stomach. Acid solutions injected into the stomach of these animals provoke an intense increase in pancreatic secretion (thereby normally helping to neutralize the acid by regurgitation). Elman⁷ has shown that bile cannot aid this neutralization for it is actually acid in reaction, rather than alkaline, as was formerly assumed. Elman and Rowlette⁹ have further shown that experimental division of the pyloric sphincter (as in the Rammstedt operation on infants and the Deaver and Judd operations for pyloric stenosis in adults) leads to persistent lowering of gastric acidity as measured by an augmented neutralization of an "acid test-meal." This, they believe, justifies the conception of the "pyloric control of gastric acidity" rather than unqualified acid control of the

pylorus. Disease of the pancreas prevents the regurgitation of alkaline fluids which would be allowed by this sphincter excision. Carcinoma of the stomach often allows rapid regurgitation of pancreatic fluid, thus lowering the gastric acidity, due to a mechanical splinting of the walls of the stomach by the cancerous tissue. This mechanical splinting may likewise slow the emptying time of these stomachs, which the lowered acidity would naturally have tended to accelerate. These observations are further of clinical importance for they help to explain why duodenal ulcers usually have higher gastric acid values than do gastric ulcers (unless the latter are near the sphincter), for this regurgitation of pancreatic juice is lessened by the duodenal narrowing. They also explain why such good results in the healing of ulcer following the making of a large stoma, as in gastric resection, pyloroplasty, or gastro-enterostomy. Many cases of hypoacidity and anacidity undoubtedly are due to rapid regurgitation of pancreatic fluid, which leads to a rapid decrease in gastric acidity, and hence to a more speedy emptying of the stomach.

If ulcers do occur in the absence of free acid (and to date it is questionable whether more than one case of this type in the literature is actually proved), what is the mechanism producing ulcer pain? There is no doubt that in many cases this pain is peristaltic in nature. Eusterman⁵ in his case noted with a kymograph the peristaltic nature of the ulcer pain, yet aspiration of the stomach at the time of this pain gave no free acid. Smith, Paul and Fowler¹⁰ have shown that the epigastric distress associated with an irritable colon is due to an increase in gastric tone and peristalsis, and in ulcer patients have produced their typical distress by inflation of the colon with air. This distress was proved to be due to increased gastric tone and peristalsis. However, in the majority of ulcer patients, it cannot be denied that the cause of their pain is an accumulation of free hydrochloric acid. This of course acts as an irritant and undoubtedly alters gastric tone and peristalsis. Palmer,¹¹ in another remarkable series of observations at Cook County Hospital, found that free acid is the usual irritant which causes ulcer distress. He produced the typical ulcer pain in ulcer patients by injections into one patient's stomach of gastric contents aspirated from another ulcer patient having pain, and by reinjection of gastric content

into the stomach of a patient in whom its aspiration had brought relief. Such distress was not caused by injection of acid gastric contents into normal stomachs. Hydrochloric acid, sulphuric acid, acetic acid, and even sodium hydroxide were injected into the stomachs of ulcer patients and the typical pain produced. Neutralization or removal of these irritants relieved the pain. He found that in many patients with gastric carcinoma the typical distress was initiated and relieved in the same manner. He found no evidence of hyperesthesia of the normal gastric mucosa or of pain as the result of hyperchlorhydria with an intact gastric or duodenal mucosa. In a large series of ulcer patients at the Cook County Hospital in Chicago he found that spontaneous ulcer pain without free acid in the gastric content removed at the time of distress has been seen only once and that in a patient with a very sensitive pain-producing mechanism. To prove the value of neutralizing free acid the same author¹² later compared the value of treatment of two groups of ulcer patients at Cook County Hospital—one with hourly milk and cream and beef tea feedings, and one with hourly milk and cream feedings and alkalis in addition. Neutralization of the free acid by alkalis, used in conjunction with the hourly milk and cream feedings, definitely favored the healing process. This was indicated both by the earlier disappearance of spontaneous pain and by the earlier disappearance of sensitivity to injections of free hydrochloric acid. The recent attempt to substitute mucin for the alkalis in ulcer management, as reported by Fogelson,¹³ further bears out the importance of free acid in ulcer management. This is still in an experimental stage but apparently may be a very useful measure. We have had no experience with its use.

Because of its bearing on the two case reports submitted below, the writers wish to digress somewhat and briefly consider the present-day views on the relationship of gastric ulcer to gastric carcinoma. Surely the finding of low gastric acid values with a gastric lesion in a patient who once had a high free acid and an ulcer demands investigation. However, as will be shown below, such a finding does not necessarily have much weight in deciding that a lesion is a malignant ulcer. Authorities are rapidly abandoning the still very prevalent idea that gastric ulcers are potential carcinomas and therefore are not to

be treated by medical management. Cole¹⁴ quotes Mayo as once making the statement that gastric ulcers over 2 cm. in diameter are malignant in 68 per cent of the cases. Cole points out that these large ulcers form only 10 per cent of all gastric ulcers. Therefore on Mayo's figures, 6.8 per cent of gastric ulcers are carcinomatous. Cole states that 6 per cent of gastric ulcers are or become malignant. He feels that repeated X-ray examinations of a gastric ulcer on treatment, at bed rest, are as decisive in ruling out carcinoma as are palpation by the surgeon at operation or even the microscopic examination of the tissue. Warthin in an address made in Minneapolis in 1929 emphasized the impression that carcinoma of the stomach is no more prevalent with or following gastric ulcer than it is in the general population not having ulcer. Emery⁴ in his series (quoted previously) found that only 4.4 per cent of his gastric ulcer patients developed carcinoma after an average follow-up period of four and one-half years. The average duration of symptoms in these patients had been nine years, thus giving a total average observation period of thirteen and one-half years. Brown³ in his report of 1,224 cases of ulcer had seventy-seven gastric ulcer patients. Of these, nine had died and in eight the cause of death was known. Only one died of carcinoma of the stomach. Bockus in discussing this report³ stated that his experience as concerned the questionable relationship of gastric ulcer to gastric carcinoma was the same as that of Brown.

CASE REPORTS

Case 1.—C. A. D., a minister, aged sixty-three years, was first seen at the Earl Clinic by one of us (G. E.) in October, 1927, with the complaints of loss of strength and vitality, sleeplessness, loss of appetite, and nervousness. No nausea or vomiting had occurred. His family history and previous medical and surgical histories were irrelevant. The physical examination is recorded as showing normal pupillary and patellar reflexes, a soft systolic murmur at the apex which was not transmitted, and essentially normal lung findings. There was slight tenderness elicited in the gallbladder region. The abdomen was mildly distended. Some varicose veins of the left leg were noted. Laboratory reports gave his hemoglobin as 74 per cent, urine normal, temperature normal, pulse 78, blood pressure 112/78, and his weight 123. An Ewald test meal at 1 hour showed free acid 0, total acid 10. An X-ray of the stomach revealed a normal stomach with no retention of the six hour barium meal, and a large saccular duodenum with a deformity very suggestive of duodenal ulcer. There was retraction laterally of the second

portion of the duodenum suggesting gallbladder adhesions. The tonsils were chronically infected and were removed. The other treatment advised was a frequent feeding schedule, including liberal amounts of milk, cod liver oil, and olive oil as tolerated. He was given dilute hydrochloric acid and essence of pepsin.

The patient was not seen again until April 4, 1931. Meanwhile he had been examined at the Mayo Clinic in September, 1929. There also a duodenal deformity was found on X-ray. His gastric analysis (fractional probably) showed a free acid of 12, with a total acid of 20 to 32. It was felt at that Clinic that the patient's symptoms were only in part, if at all, caused by an active ulcer, and that worry and care were responsible for his symptoms. He was advised to follow a bland, high-vitamin, high-caloric, anti-constipation diet and was given belladonna, bromides and charcoal after meals. Calcium carbonate was to be used one hour after each meal.

When seen here in April, 1931, he stated that his symptoms were about the same as they had been in 1927. His distress was a dull ache near the navel at times, but usually a severe bloating and sense of heaviness in the epigastrium. This was never present before breakfast, but might precede the other meals and if so was aggravated by food taking. It might originate one to two hours after meals or at times immediately after meals, always disappearing if he could belch. No night pain. No vomiting nor acute colic nor jaundice. For the past week on the advice of his family physician he had been on an hourly alternation of milk and alkalis with considerable relief. His bowels had been functioning normally. No tarry stools. His appetite was poor. His strength had been poor, especially since an attack of "flu" five months previously. He had eaten no meat for three or four months. Worry always aggravated his distress.

The physical examination revealed a rather undernourished white male of 67, weighing 116 pounds. Pupillary and other reflexes were normal. Heart and lungs and thyroid appeared normal. Tenderness was present to a moderate degree in the mid-epigastrium and very slight rigidity of the upper right rectus muscle was noted. No edema of the ankles was seen. Rectal examination yielded nothing of importance.

Laboratory Data: Hemoglobin 82 per cent, R. B. C. 3,940,000, W. B. C. 8,200. Urine showed 1 plus albumin, no sugar, occasional white cells, an occasional granular cast. Temperature 97.2, pulse 90. Blood pressure 108/75. A differential blood count was normal. The smear showed no changes of a pernicious anemia type. A one-hour Ewald yielded no returns, so the test was repeated and aspiration done at thirty minutes. This showed free acid 0. Total acid could not be titrated due to the small volume obtained. A stool specimen contained no occult blood.

The patient had to go to Chicago for about ten days before the examination was complete. He was given belladonna and bromide for an assumed spastic colon, and the usual spastic constipation diet instructions. He was also told to use 30 drops of dilute HCl with each meal and a half hour after meals.

On his return he stated that he had felt fine on this management. Another Ewald was done. At one hour the free acid was 0, total acid 9 (25 c.c. of material aspirated). A trace of occult blood was detected in this specimen. Two stools both showed a small amount of occult blood. A fractional gastric analysis was done after injecting 0.6 mgm. of histamine. The results of this in terms of points of free acid at 15, 30, 45, and 60 minutes respectively were: a trace, 13, 15, 16 points. Occult blood was very prominent in these specimens. The patient had no bleeding from the gums, but possibly a small amount from hemorrhoids. A sigmoidoscopic examination revealed no pathology. A few days later four stools showed no occult blood.

X-rays: An X-ray of the gallbladder by the oral Graham-Cole method gave a normal picture. At fluoroscopy of the stomach, Dr. J. R. Aurelius detected, high on the lesser curvature of the stomach at the junction of the upper and middle thirds on the anterior wall, a fleck, 0.5 cm. in diameter, of a small penetrating gastric ulcer. Very slight induration was indicated and very little distortion of the rugæ. No spasm nor hyperperistalsis was noted. The old duodenal deformity was again seen but no evidence of an active ulcer was suggested there. Re-ray of the stomach two days later confirmed this finding. It was depicted on one of the films taken. A colon X-ray was negative for pathology. Marked hypertrophic arthritis of the lumbar spine was seen on these films.

After careful consideration of the various aspects of this case, an operation and resection of this lesion was advised and done by one of us (G. E.) on May 8, 1931. At operation a small, indurated, partially healed ulcer with a shallow crater, 4 mm. in diameter, and with a zone of induration of 1.5 cm. diameter was found at the site shown in the X-ray. No evidence of metastases in the glands or liver was found. Simple excision of this ulcer was done. The patient made an uneventful recovery except for some painful induration in the thighs, produced by the hypodermoclysis, which prolonged his convalescence. He left the hospital in five weeks and three days. To the present date he has been on a Sippy medical management for ulcer as a post-operative measure. A recent letter from him reveals a satisfactory result. The microscopic sections of this ulcer gave no evidence of malignancy.

Case 2.—P. S., aged forty-eight years, white male, whose occupation was dishwashing, entered Ancker hospital April 26, 1931. Seven years previous he had had an operation for ulcer, the nature of which could not be ascertained. The patient apparently had symptoms of an acute perforation and thinks a gastro-enterostomy was done. His present symptoms developed three years before and consisted of localized epigastric pain just to the left of the mid-line. This pain was relieved by food, soda (1 teaspoonful) or vomiting. For a month prior to admission he had been vomiting about one hour after meals. Some dark blood had been seen in the vomitus. Tarry stools had been noted for one week. Some night pain was present till about 2 a. m. He had lost 15 pounds in the past month.

Physical examination revealed nothing of importance

in the head, neck, or thorax except a few coarse moist râles near the hilus of each lung posteriorly. These disappeared after coughing. His abdomen had an upper right rectus operative scar. Very slight epigastric tenderness was present.

The stomach was inflated with carbon dioxide (tartaric acid and soda) and no visible peristaltic waves were seen during a 20 minute period.

Laboratory Data: Blood pressure 100/70. Hemoglobin 94 per cent. Red blood cell count 4,930,000. White blood cell count 7,250. A differential count and smear were normal. The blood Wassermann was negative. A one-hour Ewald meal yielded no free hydrochloric acid and a total acid of 9. The volume of fluid aspirated was 200 c.c. No occult blood was present. One stool showed occult blood but many successive stools were free of occult blood. A histamine injection with a fractional gastric analysis yielded a good output of free hydrochloric acid (up to 32 points of free acid and 59 of total) in a one-hour period.

X-ray: Fluoroscopy of the stomach by Dr. J. R. Aurelius revealed a large penetrating gastric ulcer (3 × 2 cm.) on the lesser curvature and posterior wall of the middle third. There was also a duodenal deformity with spasm and a suggestion of a fleck ulcer being present. No evidence of a gastro-enterostomy was seen.

The patient was placed on a careful Sippy management with test aspirations periodically one-half hour after a dose of alkali and also at bedtime to be sure of effective neutralization of acidity and of emptying of the stomach. One such aspiration of the stomach one-half hour after a dose of alkali revealed free acid of 14 and total acid of 84. The hourly dose of calcium carbonate was promptly increased and successive aspirations yielded no free acid.

X-ray one month later (fluoroscopy and films) revealed, "now only the slightest evidence of the previous ulcer on the lesser curvature, showing marked improvement since the last examination. The duodenal cap remains deformed. There is now no evidence of ulcer crater and only slight spasm present in the cap. There is, however, a rather definite point of tenderness over the duodenal cap" (report again by Dr. J. R. Aurelius).

The patient was discharged from the hospital June 6, 1931, to carry on ambulatory medical management for his two ulcers, and to report back to the out-patient department of Ancker Hospital.

DISCUSSION

The advisability of resorting to surgery in Case 1 may be questioned, since medical treatment of gastric ulcer is now being chosen by the most careful authorities in preference to surgery, particularly when the ulcer is not adjacent to the outlet of the stomach. Our main reason for advising surgery was that our patient was a man of 67 years with a small gastric lesion which had developed since he was last seen here in 1927, in the face of a very low gastric acidity,

approaching an achlorhydria. We felt that his symptoms were entirely due to a spastic colon which he had obviously possessed four years previously and these symptoms were not changed by the development of the ulcer. Therefore, a symptomless gastric lesion appearing in the face of a known very low acidity was our chief reason for advising operation and excision of the ulcer. It was felt that if it was carcinoma an operative cure was assured. We were not influenced by a fear that this ulcer might develop into a carcinoma (for the lack of a good basis for this idea has already been pointed out), but we believed that this might actually be a carcinoma, due to the circumstances surrounding its development. The occult blood reactions in the stool were suggestive of carcinoma at first but later the stools were free of blood. Another reason for advising surgery was that this stomach was of a long, vertical fishhook type, with rapid emptying (so much so that even in 30 minutes an Ewald meal was recovered only once in three trials), and the ulcer was high up on the lesser curvature. We felt that in the absence of a high acidity and with the rapid emptying the usual form of medical treatment, which has as its basis neutralization of free acid, was unlikely to be highly successful for our fluoroscopy showed the impossibility of keeping the milk or alkalies in contact with this ulcer.

In passing, we wish to emphasize the technic used by Dr. Aurelius in finding this very insignificant fleck by fluoroscopy. There is no question that if, as usually is done by X-ray men, the stomach had been filled with barium, this lesion would have been missed, but by having the patient take only one swallow of barium and watching it pass over the rugæ slowly, combined with careful palpation, Dr. Aurelius detected this tiny fleck, about 0.5 cm. in diameter, on the anterior wall just off the lesser curvature at the junction of the upper and middle thirds of the stomach.

Case 2 illustrates, as does Case 1, the value of histamine in eliciting a flow of free acid when Ewald meals showed an achlorhydria. Comfort and Osterberg¹⁵ in a recent report from the Mayo Clinic question the advantages of histamine over an Ewald or fractional test, except in cases where a gastro-enterostomy or gastric resection allows alkaline regurgitated fluids to mask the output of free acid. They state that the advantages of histamine over the Ewald are not great enough

to warrant the adoption of stimulation by histamine as a routine procedure. These authors also cite cases of gastric carcinoma having as great a concentration and volume of free hydrochloric acid as those obtained in duodenal ulcer. In our experience we have found histamine stimulation to be an invaluable aid in separating apparent from true achlorhydria. The dose used is 0.1 mgm. of histamine subcutaneously for each 10 kilos of body weight of the patient.

Another valuable aid in the analysis of apparent achlorhydria in ulcer patients is the therapeutic aspiration, *i.e.*, aspiration of gastric contents at a time when the patient complains of pain. If this had been done more frequently, the literature relating to achlorhydria in ulcer patients would be very nearly negligible. Our second patient who showed no free acid with an Ewald meal not only had a good output of free acid with histamine stimulation but also showed free acid in good concentration in one test aspiration (one half hour after a dose of alkali) which aspirations are routine on our service in ulcer cases. Aspiration for free acid three hours after a Riegel meal or four hours after an ordinary meal will usually show a high acid concentration in ulcer patients though the test meals show achlorhydria.

It must be emphasized that gastric contents containing food must be titrated immediately and cannot be allowed to stand overnight if the true free acid values are desired. Otherwise the free acid is changed to combined acid.

Finally, the importance of routine stool examinations for occult blood is not to be overlooked. Finding occult blood, of course, may be compatible with either ulcer or carcinoma, but the absence of occult blood, using the benzidine test, in repeated stool examinations, rules out the presence of carcinoma with as great an accuracy as is offered by X-ray. In our Case 1 both the X-ray and the stool examinations pointed to the absence of carcinoma, yet we feared it because of the hypochlorhydria which was known to have been present for at least four years. Our fears were unfounded. In our Case 2 the absence of occult blood in repeated stool examinations absolutely confirmed the X-ray diagnosis that this large lesion on the lesser curvature was a benign penetrating ulcer. Any malignant lesion of that size will continue to show 4 plus occult blood reactions in the stools.

The rapid disappearance of the huge penetrating lesion as shown by repeated X-ray studies in Case 2 is typical of the very satisfactory results of medical treatment of gastric ulcers in general, if uncomplicated by pyloric obstruction.

SUMMARY

Literature is cited to show the confusion that exists regarding the coincidence of peptic ulcer and achlorhydria and to prove that, with only one or two exceptions, cases reported to show such a coincidence have been insufficiently studied and are unproved. Two case reports are included showing gastric ulcers with apparent achlorhydria but in which more careful study revealed an adequate free acid concentration compatible with peptic ulcer. The methods available in the study of gastric acidity in ulcer are discussed. The importance of routine stool examinations in the diagnosis of ulcer and gastric carcinoma is emphasized.

CONCLUSIONS

1. An active peptic ulcer in the presence of true gastric achlorhydria is so rare as to be negligible.
2. Histamine stimulation of gastric secretion should always be tried before diagnosing achlorhydria, or even hypochlorhydria, where peptic ulcer is suspected. In our experience it has caused free acid to appear frequently where the ordinary test meals showed achlorhydria.
3. Aspirations of the stomach at the time of suspected ulcer distress, or four hours after a heavy meal or Riegel meal, should be resorted to if an Ewald shows no free acid. Failure to use all of these useful procedures is responsible for nearly all the reported and erroneous diagnoses of achlorhydria associated with peptic ulcer.

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PEPTIC ULCER: A REVIEW OF RECENT OPINIONS OF ETIOLOGY AND TREATMENT*

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MANY American clinicians are inclined to subscribe to the theory that the typical callosus peptic ulcer forms from acute lesions or erosions, which are rendered chronic by their position and the action of the gastric juice. Numerous ideas with regard to the formation of acute lesions have been advanced; it has been suggested that they may be of vascular, traumatic, or infectious origin. The vascular theory, first suggested by Virchow, is supported by the work of numerous investigators who have demonstrated lesions in the gastric arteries. More recently von Bergmann has suggested that spasmotic contraction of the afferent vessels of the stomach may be responsible for localized destruction of the mucosa.

The researches of Ivy,^{8,14} McCann and other investigators indicate the relation of trauma to the development and healing of ulcer. Undoubtedly, the gastric and duodenal mucosa is often injured from coarse particles of food, hot or cold beverages, vomiting, external pressure and chemical irritants. Such lesions are probably not confined to any one area in the stomach; from what is known of gastric mechanics, they should be most common along the lesser curvature, in the pyloric antrum, and in the duodenum, regions of the stomach which constitute the so-called Magenstrasse or gastric groove.

Many infectious processes have been known to cause acute gastric ulceration or erosion, and it is a matter of general clinical observation that reactivation of duodenal ulcer often follows infection of the upper part of the respiratory tract or interference with oral foci. The work of Rosenow, in 1913, called attention to the significance of distant foci of infection. Streptococci isolated from such foci produced gastric lesions ranging from hemorrhagic areas to superficial erosions in experimental animals. Such lesions may well furnish the original mucosal defect

from which a chronic ulcer is formed by traumatic, chemical, and constitutional factors.

It is probable that acute gastric or duodenal lesions of one kind or another must be fairly common, and that they usually heal without producing symptoms. The knowledge of what determines the course of such lesions, and why some heal whereas others become chronic and intractable, would probably settle many disputed questions with regard to ulcer. The position of the lesions is, of course, significant; those which lie in the gastric groove are subjected to additional chemical or mechanical trauma and may readily become chronic. This "mechanical functional hypothesis" for which we are indebted to Bolton and to Aschoff, cannot be overlooked in any consideration of the etiology of ulcer.

Constitutional factors, perhaps, deserve the next consideration. It is generally recognized that such conditions as an ulcer diathesis and ulcer disposition exist, but on what factors these are based has not been explained. Draper's data suggested a certain similarity in anthropometric measurements in cases of ulcer, as contrasted, for example, with cases of cholecystitis. Various writers have suggested a vagotonic constitution as a prerequisite to the development of ulcer; others have suggested a sort of spasmophilic diathesis as a basis. Winkelstein advanced the idea that patients with peptic ulcer are more sensitive to a variety of physical and pharmacologic stimuli than normal persons. Hypotheses of the constitutional basis of ulcer presuppose to a greater or less extent abnormal reactivity of gastric secretion and motility to psychic and emotional stimuli as well as to the stimulus of ingested food. Clinically there is much to support this view, since reactivation of symptoms of ulcer under emotional stress is common. Recent studies on gastric innervation are of interest in this connection, since any constitutional tendency to ulcer might well be associated with functional abnormalities of nervous connections.

*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Read before the Northern Minnesota Medical Association, Hibbing, Minnesota, September 14, 1931.

Hartzell found that after section of the vagi of dogs there was a reduction in the amount and the acidity of gastric secretion, and that the psychic variations in secretion were practically abolished. After section of the splanchnic nerves, Vanzant found little change in the reaction of gastric secretion to various stimuli; she also checked data concerning Hartzell's original animals and found that two years after vagotomy the normal secretory activity was restored. Animals with completely denervated stomachs also exhibited an essentially normal response, although the flow of gastric juice after a meal of meat or an injection of histamine was distinctly slower and of a less magnitude than before operation. Such results can only be interpreted to show that the stomach has a high degree of automaticity in respect to both its motor and secretory functions, and that its nerve connections do not control all of the various processes which may underlie gastroduodenal ulceration.

Chemical factors in the production of ulcer have been regarded as of great significance since the corrosive action of gastric juice was first demonstrated; in fact, the presence of free hydrochloric acid in gastric secretion is a sort of *sine qua non* in ulcer. It has been generally held that secretions of the stomach have no effect on normal gastric or duodenal mucosa if the blood supply is adequate. The recent experiments of Overgaard, who was able to produce pyloric gastritis with superficial erosions by giving repeated injections of histamine to fasting dogs, bring this older view into question. However, many normal persons have a more or less continuous hyperacid secretion, but do not have demonstrable ulcer. It has been stated that there is a protective mechanism which may fail and thereby favor the development of ulcer, but definite proof of this is not available. Mucin, which is one of the recognized physiologic antacid substances, is likely to be present in gastric secretion roughly in an inverse proportion to the height of acidity. Another protective factor, the normal alkalinity of the duodenal secretions, may be still more essential. Mann and Williamson, by diverting the biliary and pancreatic secretions into the ileum and connecting the jejunum directly with the stomach, produced chronic indurated jejunal ulcers with great uniformity. Bollman noted similar ulcers in experimental obstructive

jaundice. Apparently the neutralization of gastric acid by the duodenal juices, bile and mucin is a protective mechanism which usually prevents corrosive action. Why such protective mechanism fails in the presence of ulcer is still unexplained.

American views on the genesis of ulcer have been well stated by Crohn; his statement may be paraphrased here. He assumes that ulcer occurs in young subjects of vagotonic habitus, whose gastroduodenal mucosa is rendered vulnerable by vascular spasm, infection, or trauma, and has been digested by the corrosive action of the gastric juice. If the erosion occurs in the gastric groove it is rendered chronic by its situation and consequent exposure to mechanical and chemical irritation. Secondary factors such as vascular occlusion, focal infection, and motor dysfunction then tend to perpetuate the lesion. In chronic ulcer, motor disturbances are undoubtedly of the greatest significance. Pyloric obstruction, even if temporary, tends to delay the healing of experimental peptic ulcers; pylorospasm is probably responsible for most of the daily pain and discomfort of the patient with ulcer; and, finally, all successful surgical procedures for the cure of ulcer involve either the division or removal of the pyloric sphincter, or else render it functionally useless. The pylorus forms the mixing valve arrangement by which the reaction of the gastric content is regulated in the region of the stomach most subject to ulceration. More information regarding the pathologic physiology of this important structure would furnish many additional clues to the cause of ulcer and means whereby it might be cured.

At present, the hypothesis of German observers on the etiology and nature of ulcer forms a decided contrast to those held in this country. Constitutional factors are of course regarded as important, and the "mechanical functional hypothesis" is given credence. Views on the relation of gastritis and duodenitis to ulcer, however, exert the greatest influence on ideas of treatment. Konjetzny and others assert that all gastroduodenal ulceration is accompanied by gastritis and duodenitis which may take the form of submucosal infiltration, simple erosion, or superficial, but nevertheless chronic, ulceration. German pathologists and surgeons have presented a great deal of evidence in support of this view, and their claims cannot be easily dismissed. During a recent visit to German surgical clinics, I

had the opportunity of seeing a large number of specimens of resected stomachs. In most of them gastritis, duodenitis, and multiple superficial ulcerations were definitely present; in other specimens, the diffuse inflammatory process was less definite. American observers have not been impressed by the relation of gastritis to ulcer, although it is generally agreed that ulceration in either stomach or duodenum may be and often is accompanied by local inflammation. Judd, Nagel and Rivers described the clinical syndrome and the pathologic pictures of duodenitis, gastritis, and gastrojejunitis. Unfortunately, the syndrome of associated ulcer and gastritis is difficult to establish. Most of the evidence now available has been observed in pathologic specimens, and at operation. There is no characteristic change in secretory activity in gastritis. Roentgen-ray diagnosis of the condition is extremely difficult and only gastroscopy can establish the diagnosis unless operation is performed. Gastritis is probably worthy of greater attention than it has hitherto received, particularly from the standpoint of diagnosis in the intact individual. In Germany students of the subject have a distinct advantage because of the frequent use of the gastroscope and the practice of doing extensive gastric resections for all types of peptic ulceration, which furnishes much fresh pathologic material for study. Those who are advocates of the theory of gastritis naturally favor resection as essential to cure. It is obvious that any marked degree of this condition precludes to some extent successful medical treatment and also favors the development of recurrent or anastomotic ulceration when conservative surgical measures are practiced.

TREATMENT

In the United States the value of the Sippy treatment or some modification of it in selected cases, particularly in those in which ulcers have recently formed, is generally conceded. Hospitalization of the patient is necessary, and rigid control of the gastric acidity must be carried out if the best results are to be obtained. If lesions are chronic, treatment, even under the best possible conditions, will not yield as high a percentage of permanent medical cures as one might wish. Many patients with chronic duodenal ulcer are unwilling to submit to rigid medical treatment, and some ambulatory form of treat-

ment must be devised. Curiously enough, ambulatory treatment has a fairly good record in the treatment of peptic ulcer. Blackford and Bowers have shown that with ambulatory treatment the end-results are practically as good as if patients have had the benefit of thorough hospital treatment. Recently, some new forms of medical treatment have been suggested. The work of Fogelson on the use of gastric mucin has attracted much attention, but it is still too early to evaluate results. Symptomatic relief has been obtained in many cases, but in some cases of long standing the results have been less satisfactory. Specific vaccines have been employed with variable results, but in general this type of treatment is not greatly favored in the United States. The use of nonspecific vaccines, which was originally advocated in Germany, seems to have been largely abandoned by clinicians there. The method of treatment has been used at The Mayo Clinic in the treatment of recurrent ulcer with somewhat disappointing results. Often gastric acidity is reduced for a matter of twenty-four hours following the administration of typhoid vaccine, and during this period there may be definite relief of pain. Only in the occasional case have the results been sufficiently permanent to encourage further trial of the treatment.

American statistics as to the percentage of medical cures of duodenal ulcer vary greatly, as do percentages on mortality in cases in which operation is not performed. Cures have been claimed in 80 per cent of cases; more conservative figures are as low as 20 per cent. The results to be expected from medical treatment vary greatly with age and sex, duration of the ulcer, and the patient's economic condition. The asserted permanency of the cure depends to a great extent on the length of time a given case is followed. Symptomatic relief is easy to obtain, but permanent and complete cure is an entirely different matter. It must not be forgotten that spontaneous cures do occur. According to Stewart, about 12 per cent of subjects coming to necropsy present evidence of past or present ulceration of the stomach; Robertson and Hargis' figures are considerably higher (20 per cent). Symptoms of ulcer are not present in all of these cases; in many, only brief atypical periods of indigestion are known to have occurred. Usually only the most cursory treatment has been given, nevertheless at necropsy a considerable percent-

age of the lesions is completely healed. These facts must be considered in the evaluation of any form of treatment.

Medical treatment of duodenal ulcer in European clinics is probably not practiced as extensively as in this country; economic difficulties are the principal objection to treatment of this type. Several popular forms of medical treatment are practiced in Germany, such as the Lenthartz diet with or without alkali; various types of bland food given with large amounts of dextrose and belladonna to the point of tolerance, and the Sippy treatment or some modification of it. In some central European clinics a sugar cure is used, on the basis that patients with ulcer suffer from chronic acidosis, as shown by increased tolerance to alkalis. Insulin was originally used in this treatment, but at present large doses of sugar by mouth are employed to compel the patient to manufacture his own insulin. In one German clinic I visited jejunal feeding by means of a special tube was the method of choice. This involves retention of the tube for several weeks, and in spite of the incidental discomfort good temporary results are obtained. Many German physicians are rather pessimistic as to the permanence of the medical cure of ulcer, and I found it difficult to obtain entirely satisfactory data as to the end-results. A number of the internists took the view that it is necessary to produce radical change in gastric physiologic processes before permanent cure can be expected.

Surgical treatment of duodenal ulcer in America and in the British Isles has been confined largely to gastro-enterostomy or some form of pyloroplasty; gastrectomy is reserved as a rule for gastric ulcer or carcinoma. Statistics on the value of these conservative procedures collected over a period of years indicate that good results are obtained in approximately 90 per cent of cases. The surgical mortality varies with the experience of the operator, but in skilled hands it may be as low as 1 per cent. The rate of recurrence does not seem to be particularly high; the most accurate figures available indicate that it does not exceed 5 per cent. Gastrectomy has been advocated by certain groups of surgeons in this country largely as a means of avoiding recurrent or anastomotic ulcers. In one American institution in which partial gastrectomy for duodenal ulcer is widely practiced, associated gastritis and duodenitis is said to be common.

In many of the German, Austrian, and Hungarian clinics, and in one large clinic in Paris, gastrectomy is almost universally employed in the treatment of both duodenal and gastric ulcer. German surgeons in general state that the rate of recurrence of ulcer after conservative operation (gastro-enterostomy or pyloroplasty) varies between 10 and 35 per cent. This high rate may be due to the gastritis, duodenitis, and multiple ulcerations which are observed so frequently in these clinics; it may also be due to delayed surgical intervention. The average surgical mortality for subtotal gastrectomy is not less than 5 per cent; good permanent results are obtained in about 85 per cent of cases. The rate of recurrence of ulcer after subtotal gastrectomy is said to be about 1 per cent or less. However, the operation is not without drawbacks and some of its proponents admit that a fairly large group of patients appears to have a good deal of trouble in spite of extensive resection. Gastrogenic diarrhea, anemia, cholangitis, and motor disturbances are the common causes of unsatisfactory results. Henning recently performed gastros-copy on a considerable number of patients who have continued to suffer with digestive disturbances following subtotal gastrectomy. He found that a high percentage of them had definite, visible gastritis which is persistent.

So far as the future of primary partial gastrectomy for duodenal ulcer in this country is concerned, it appears that it should be confined to individual cases in which marked diffuse gastro-duodenitis or multiple ulcerations can be demonstrated. Unfortunately, such demonstration is not often possible except at the time of operation. If one were certain of detecting in advance the patient with a constitutional tendency to the formation of ulcer and therefore especially likely to recurrence, gastrectomy might be justifiable for this type also. It does not, however, seem entirely proper to use the admittedly high incidence of recurrence of ulcer in European clinics as an argument in favor of gastrectomy in this country, since there are probably pathologic variations as well as economic and dietary factors which may explain the variations observed.

SUMMARY

Many American students are inclined to regard gastroduodenal ulceration as the end-result of an acute lesion produced by trauma, infection,

or vascular lesions, which has become chronic because of its position and the corrosive activity of the gastric juice. The process is regarded as essentially reversible and one which may be corrected by a proper dietary regimen, the control of gastric acidity, and removal of foci of infection, provided the psychic and environmental factors which may predispose to ulcer can also be regulated. In the intractable chronic case, in which economic and other handicaps and such complications as hemorrhage, obstruction, and penetration enter the picture, surgery, usually of a conservative type, is the procedure advocated.

In central European clinics, a high incidence of associated gastritis and duodenitis and a stated high rate of recurrence after conservative surgical procedures combine to make subtotal gastrectomy the preferred method of treatment. It is suggested that perhaps geographic, dietary, and environmental factors may be involved in these differences of opinion, and that a closer comparison of the pathologic changes of ulcer as it is observed in this country and in central Europe may help to reconcile the advocates of radical and conservative methods of treatment.

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CONVULSIONS IN CHILDHOOD*

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A CONVULSION is one of the most alarming symptoms which can occur to a child. To the parents it signifies an impending catastrophe and to the physician, unless he recognizes epilepsy, the symptom presents an acute problem for treatment and diagnosis. While a convulsion is usually not fatal, it always produces a certain amount of cerebral damage which lowers the threshold for subsequent attacks; therefore immediately succeeding the problem of the control of the acute attack comes the question of a differential diagnosis. Every effort must be made to determine the basic cause of the symptom, convulsive state, and to prevent a recurrence. In this paper a convulsion is interpreted as a series of involuntary contractions of a group or of several groups of muscles usually associated with a loss of consciousness or cerebral function.

I have made a study of 400 children who have been brought to the Milwaukee Children's Hospital in the past five years for the treatment of acute convulsions. The ages of the patients range from an hour to fifteen years. Many were brought in during or shortly after a convulsion. It will be realized that with the attendant excitement and confusion and the unavoidable delay the physician often arrives at the home or the patient at the hospital after the convulsion is over.

In each case every possible effort was made by clinical and laboratory examinations to make a diagnosis. This includes as complete a history as obtainable, a complete physical (and neurological) examination, examination of the fundi, urinalysis, spinal fluid examination, X-ray of the skull, and determinations of the blood Ca, P, N, blood culture, etc., somewhat in the respective sequence. Some patients were seen only once and for a short time, often making a diagnosis impossible.

On the basis of this study a classification of

convulsions is presented according to age groups (Tables 1, 2, 3, 4). This classification has been found to be the most convenient for clinical purposes. It will be noted that the most common cause of convulsions in the newborn infants is cerebral injury (hemorrhage, congestion, or edema). The premature infant is most susceptible because of his soft bones, ununited sutures, widely open fontanel, and fragile vessels. Long labors, or rapid precipitate deliveries, breech deliveries, or instrumental deliveries are predisposing factors but often there is a history of a normal labor and delivery.

There is a period between the first few weeks of life and approximately eight months when convulsions are relatively infrequent. The explanation is obvious: the immediate results of birth injury are passed, tetany is not yet present, and the acute infectious diseases do not occur.

TABLE 1.—NEWBORN INFANTS AND FIRST MONTH

1. *Cerebral Injury.*
 - Hemorrhage.
 - Subtentorial
 - Subpial
 - Ventricular
 - Compression.
 - Congestion
 - Anemia
2. *Septicemia.*
 - Nasopharynx.
 - Umbilicus.
 - Skin Infections.
3. *Congenital Anomalies.*
 - Hydrocephalus.

TABLE 2.—FIRST TO EIGHTH MONTH

1. Residue of Birth Injury.
2. Septicemia, Onset Acute Infections.
3. Congenital Anomalies.
4. Toxic: Poisons, Terminal.

TABLE 3.—EIGHT TO THIRTY-SIX MONTHS

1. Spasmophilia or Tetany.
2. Septicemia, Including Onset of Acute Infections as Pneumonia, Meningitis, etc., and the Onset of the Acute Infectious Diseases.
3. Residue of Birth Injury.
 - Hydrocephalus.
 - Congenital Anomalies.
 - Syphilis.
 - Epilepsy.
 - Cerebral Hemorrhage.
 - Serous Meningitis.
 - Brain Tumor or Cyst.
 - Toxic: Intestinal Obstruction, etc.

*From the Department of Pediatrics, Marquette University, and The Milwaukee Children's Hospital. Read before the annual meeting of the Southern Minnesota Medical Association, Faribault, Minnesota, August 24, 1931.

TABLE 4.—THREE TO FOURTEEN YEARS

1. Residue of Birth Injury.
2. Septicemia Including Onset Infections and Infectious Diseases.
3. Epilepsy.
4. Spasmophilia.
5. Chronic Encephalitis, or Encephalitis or Meningitis Residue.
6. Brain Tumor or Cyst.
7. Hydrocephalus.
8. Toxic, etc.

The most common causes left are the residues of birth injury and the onset of acute infections or septicemia.

From eight to thirty-six months of age, spasmophilia dominates the picture as the cause of convulsions, closely followed in frequency by the onset of the acute infectious diseases. Tetany occurs in the rachitic infant usually in the spring and fall.

After three years the onset of acute infections and the infectious diseases are the important factors, followed by the residues of birth injury, epilepsy, etc.

Most convulsions are the immediate result of cerebral edema. This may not necessarily be expressed in an increase of the spinal fluid pressure. The fluid may be held bound in the brain cells. The convulsions of the acute septicemias and of epilepsy are usually associated with a polynuclear leukocytosis.

Treatment.—The immediate treatment of most convulsions is the treatment of cerebral edema.

Two to 6 ounces of a saturated solution (50 per cent) of magnesium sulphate should be given by mouth, if possible, or by rectum following an enema. A 10 per cent solution of glucose or of sodium chloride intravenously will produce the same hypertonic effect. For quicker action 5 to 20 c.c. of a 10 per cent solution of magnesium

sulphate may be injected intravenously (slowly) or intramuscularly.

If the child is seen in acute convulsions in the home and facilities are limited, chloroform anesthesia offers a quick and effective method of treatment which is easily administered. Ether is a second choice.

TABLE 5.—TREATMENT OF CONVULSIONS

1. Protect Against Injury.
2. Chloroform or Ether Anesthesia.
3. Saturated Solution of 25 per cent Magnesium Sulphate, 4 ounces by Rectum or by Mouth; or and, 2 to 5 c.c. of 2 to 10 per cent Solution Intravenously, or 5 to 10 c.c. Intramuscularly.
4. Spinal Puncture If No Brain Tumor.
5. Chloral by Rectum.
6. Phenobarbital by Mouth or Soluble Barbituric Acid Preparations Hypodermically.
7. Treat Basic Disease.

Spinal fluid drainage is indicated as a therapeutic and diagnostic measure as soon as it can be done. A possible brain tumor, of course, demands caution in the withdrawal of fluid.

Sodium-phenobarbital and other new soluble barbituric acid compounds may be injected intramuscularly. Sodium amytal (Lilly's special preparation for intravenous injection) may be injected intravenously, 1.5 mg. per kilo body weight, if the child is quiet enough to permit it. This drug has been effective in two cases in which all of the above procedures were futile.

After the immediate treatment of the convulsion the basic disease should be given attention.

Conclusions.—The most important factor in a consideration of convulsions is the differential diagnosis. A convulsion is only a symptom and is usually due to cerebral edema. The immediate treatment of the convulsion is the treatment of cerebral edema.

NORMAL AND ABNORMAL MOTILITY SYNDROMES OF THE UPPER URINARY TRACT, WITH INDICATIONS FOR DRUG AND SYMPATHECTOMY THERAPY*

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A LARGE proportion of medical investigation and effort in the field of the physiology of the kidney has heretofore been mostly confined to observations on the secretory function. Very recently investigations have delved into the dynamic or motility side of the renal and ureteral physiology and at present I feel we are just on the threshold of many valuable developments in this field.

When one considers that adequate drainage of the urinary tract is of such extreme importance in infections of the kidney, renal sufficiency and calculus formation, we must conclude that we have been rather lax in our investigation and observation along this line.

The influence of the central nervous system on the secretory function of the kidney has long been a subject of research endeavor. Claude Bernard, way back in 1859, observed that cutting the splanchnic nerves in the dog resulted in an increase in the amount of urine secreted by the kidney. Since that time there have been numerous reports of experimental work done in this field.

At present it is generally accepted that the secretory function of the kidney is controlled by the vasomotor action of the sympathetic nerves. We now know that the entire nerve supply to the kidney may be interrupted in either one or both kidneys in the human without any untoward effect. Not only is there no untoward effect, but we know that the volume of urine secreted is increased about 25 per cent, with a relative decrease in concentration and an actual increase in the total amount of solids secreted.

I mention this to relieve any anxiety about any damage to renal function resulting from renal sympathectomy which may be contemplated to relieve painful renal syndromes which will be described at greater length later on. Heretofore, patients with such conditions as renalgia or nephralgia, painful nephroptosis, and various

painful conditions calling for plastic operations, have been operated upon with rather inaccurate theoretical indications.

This brings up the question of a recent aid in the way of investigation of the upper urinary tract physiology as regards the motility. Manges has visualized the renal pelvis fluoroscopically since 1912 mainly for the purpose of insuring satisfactory filling of the renal pelvis or ureter before taking pyeloureterograms. Recently a number of investigators have made further detailed observations by this method. Jona and Flecker last July reported some observations on the action of atropin, morphin, eserine, pituitrin and ergot on the motility of the renal pelvis and ureter by direct fluoroscopic observation. They found that atropin resulted in definite relaxation and distention of the renal pelvis even to the extent of producing pain, which pain in turn was relieved by the administration of eserine. They observed that morphin, eserine, pituitrin and ergot all definitely stimulated the motility.

Shortly after this Harris and Harris reported their observations on a series of 28 patients in whom they had done renal sympathectomy for painful abnormal renal motility syndromes, with 100 per cent satisfactory relief. They made their diagnosis of what they called renal sympatheticonus by the fluoroscopic demonstration of spasm in any portion of the renal pelvis accompanied by delayed emptying time, reproduction of the pain by over-distention, and symptomatic relief of the pain by the administration of eserine. Of particular interest was their report of one case of chronic glomerular nephritis which was not doing well under medical management but definitely improved a year after renal sympathectomy on each kidney with a three months' interval between operations.

The above contributions have been the basis of the observations that I have made and which I am interested in reporting today.

Slides were shown illustrating (1) the nerve supply to the kidney with its anatomical rela-

*Read before the annual meeting of the Southern Minnesota Medical Association, Faribault, Minnesota, August 24, 1931.

tions in the region of the renal pedicle and pelvis; (2) the normal mechanism of the renal pelvis and ureter; (3) abnormal mechanisms of the renal pelvis and ureter; (4) urograms illustrating various abnormal motility syndromes. The treatment of these cases was discussed and the results of the administration of eserine and renal sympathectomy were described.

I feel very strongly that in the past countless patients with painful abnormal motility syndromes have gone on without relief because of our inability to recognize them by the means of urological investigations then at hand.

SUMMARY

1. We have available a method of observation of the motility of the upper urinary tract which should prove to be a fertile field for further useful and productive work.

2. Abnormal motility syndromes, corresponding to pylorospasm, cardiospasm, hypermotility of the stomach, spastic colon, and auricular fibrillation, will be recognized as definite entities occurring in the urinary tract.

3. The operation of nephropexy most likely is successful or unsuccessful in relieving the renal pain according to the degree to which the sympathetic nerve supply to the kidney is interfered with during the operation.

4. The satisfactory results in pain relief in much of the plastic work that is now being done upon the kidney I believe in many instances to be due to interference with the central nervous system control on the motility of the upper urinary tract.

5. Renal sympatheticonus, as described by Harris and Harris, seems to be a well-defined entity which may be relieved by eserine or renal sympathectomy.

6. There have been a few cases of painful ureteral motility syndromes which have been relieved by nerve-stripping of the ureter, as reported by some recent writers.

7. The field of renal sympathectomy for certain nephritic conditions is merely mentioned as being a field for future observation and work.

8. Reflex anuria in a case of ureteral lithiasis had been relieved by injection of the splanchnic nerves by the method of Kappis.

MALIGNANT CONDITIONS IN RADIOACTIVE PERSONS

In 1925, Martland reported cases of anemia and of necrosis of the jaw in persons who had been employed in painting watch dials with paint made luminous by the addition of radium, mesothorium and radiothorium. During several years previous to 1924, 800 girls did such work in a New Jersey factory. The girls swallowed small amounts of radioactive paint day after day as a result of pointing the brushes with the lips. Some who had worked for one or more years developed necrosis of the jaw and anemia, from which, up to 1928, thirteen died. Now, however, another pathologic condition seems to have arisen among the employees who swallowed radioactive paint. Since 1928, rapidly growing osteogenic sarcomas have appeared in at least eight cases. In consideration of recent developments the high incidence of primary carcinoma of the lungs in the cobalt miners of Schneeberg and in the pitch-

blende mines of Joachimstahl, and the various lesions produced by external exposure to radium and X-rays, demand investigation, and many of the radioactive substances sold to the public for the cure of various ailments may be dangerous to health. Testifying against the interstate sale of vials of mesothorium and radium which were to be injected after being dissolved in water, Martland reported that he had examined two patients who had taken such water from one to two years and found both to show radioactivity, and both had extensive necrosis of the upper jaw. Martland states that waters which contain only emanation are frauds and he doubts whether they are harmless. The drinking over long periods of time of radioactive waters containing radon, and the drinking of natural radioactive waters, should be discouraged. Martland likewise cautions against the intravenous injection of long lived radioactive elements. (Jour. A. M. A., December 26, 1931, p. 1968.)

CONSERVATION OF HEARING*

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THE extent of deafness affords an economic and sociologic problem of a magnitude not generally appreciated. Recent surveys place the number of school children in the United States with defective hearing at three million, and it is roughly estimated that from six to eight million of our entire population are afflicted by a loss of hearing acuity to a greater or less degree. This shows the incidence of six per cent of our people deafened to such a degree as to be hampered in their capacity to enjoy normal contact with their families and society, and also seriously handicapped in acquiring an education and making a living. This puts a heavy responsibility on society, and especially on the medical profession, in trying to remedy this as far as possible. Admittedly, the majority of these cases have only moderate impairment of hearing at first. This, however, may become aggravated and permanent if not cared for early. Otologists hold that by far the greater number of beginning cases of deafness are amenable to treatment, and it is therefore necessary that deafness be detected promptly, so that proper steps can be taken to prevent the condition from becoming chronic.

Due to its insidious onset, deafness, unlike visual and other defects, is not readily recognized, and may be overlooked for a long time by parents, teachers, and the medical profession. In preschool years, and in later life, it is harder to check up than during school years, which time offers the best opportunity for detecting and preventing deafness. Recognizing this, the Section of Otology of the American Medical Association in 1929 adopted the following resolution:

"Whereas, Recognizing the fact that the most effective means for the prevention of deafness consists in the early detection of hearing impairment, thereby giving opportunity for the prompt removal of contributing causes, and believing it to be one of the important functions of our public school authorities to safeguard the integrity of the special sense organs, as well as the general health of the school child, be it

Resolved, by the American Medical Association, that it heartily favors the provision by our public school

authorities for regular periodic examinations of the hearing acuity of all public school children, such examinations to be adequate to detect even slight degrees of hearing loss."

Any satisfactory early detection in the very young is quite difficult and requires the coöperation of parents, general practitioner, the pediatrician, and the otologist. The evidence then is largely circumstantial. The backward and undeveloped child with nutritional disturbances, frequent colds, nasal discharge, adenoids, paranasal and throat affections, and cervical adenopathy, all tending to inflammatory ear involvement, invariably develops more or less loss of hearing acuity.

It will be seen that the care of the deafened child is not necessarily an ear problem, but rather one for the pediatrician. Sanitary, dietetic, and nutritional management underlies all preventive measures.

Various tests have been devised which record with more or less accuracy the kind and degree of loss: (1) conversational voice; (2) whispered voice; (3) watch; (4) forks (Weber, Schwabach, Rinne).

These tests, however, may be classed largely as qualitative tests, they are laborious, and only one person at a time can be checked up. As long as it is so difficult to detect hearing defects in preschool age, it is important that we make use of the opportunity offered in health examinations in schools when we have access to all of our future citizens, and at a time when preventive measures are still available and effective.

The audiometer, an instrument which enables one to test the hearing of groups of children, up to forty in number, is now available. This instrument was devised with the coöperation of the officers of the American Federation of Leagues for the Hard of Hearing, by the technical staff of the Bell Telephone Laboratories. This instrument makes a fairly stable and accurate record of the degree of deafness, and is the only method so far devised which is least influenced by outside interference and errors

*Presidential address read before the Southern Minnesota Medical Association, Faribault, Minnesota, August 24, 1931.

arising from the human factor of patient and examiner.

In classifying deafness, we must consider three main groups: (1) congenital deafness; (2) acquired conductive deafness; (3) acquired perceptive deafness.

The congenitally deaf do not come into the realm of this discussion; however, a recent report in the *Journal of the American Medical Association* by Shambaugh on the examination of 5,348 cases in schools for the deaf, gives the interesting data that 62 per cent are congenitally deaf, and of the acquired cases, 50 per cent developed before the age of three. Meningitis causes 20 per cent, measles 8.5 per cent, scarlet fever 7 per cent, influenza 7 per cent. The Wassermann test was positive in only two of 396 cases examined. There was a history of consanguinity in one-third of the cases; three-fifths of the cases had speech defects.

Acquired conductive deafness is the form usually found in early life, and offers the best prospects for amelioration and cure. It is the result of infections and catarrhal inflammations of the middle ear and mastoid, interfering with proper sound conduction to the labyrinth and auditory center.

External diseases and conditions like furunculosis, cerumen, and foreign bodies may cause temporary deafness by obstruction and myringitis. Acute and chronic catarrhal and purulent otitis are most frequent causes, especially when there is mastoid involvement. All these may result from naso-pharyngeal infections of various bacterial origin, through a chronic inflammatory process gaining entry by way of the eustachian tube. Chronic exudative or adhesive catarrhal middle ear involvements are more disastrous to hearing than the acute purulent and inflammatory kinds, because of the insidious and painless onset. Destructive changes of the conducting apparatus frequently go on unnoticed and unattended until serious permanent damage is done to the hearing. The acute fulminating and painful inflammations and suppurations go on to resolution more quickly, because they usually receive proper attention early.

Acquired nerve or perceptive deafness is more prevalent later in life, and is due to constitutional and toxic blood diseases, which do not affect children so often. Some inner ear or perceptive

involvements are due to extension from middle ear suppuration, but usually they are idiopathic, the direct results of such conditions as meningitis, typhoid and scarlet fever, measles, diphtheria, influenza, mumps, nephritis, diabetes, syphilis, and focal infections in teeth and tonsils, whose toxins may be destructive to the auditory tract from labyrinth to center in brain. Head injuries are frequent causes of nerve deafness.

Then we have otosclerosis—the mysterious hearing involvement with progressive and permanent deafness, which is due to trophic disturbances and bone changes, possibly an endocrin disturbance.

The prevention of hearing loss requires the care of inflammatory processes of ears in children, adolescents, and adults at the earliest possible time of onset, and the correction of the causes of deafness, when possible.

Proper sanitary living conditions, as to fresh air with proper humidity in dwellings and sleeping quarters, proper clothing, so as to prevent repeated colds and upper respiratory infections, are the first essentials of prophylaxis. Dietetic regulations are of equal importance. Malnutrition, due to lack of fat vitamins, predisposes and underlies deafness. Deafness frequently dates back to an attack of scarlet fever and measles, when the attending physician is satisfied to get the patient over the contagion, while the overlooked ear sequelæ may lead to a handicap every bit as momentous as a heart or kidney complication.

Conditions which may cause deafness, such as head colds, sore throats, nose and sinus infections, and nasal obstructions, should be treated. Forceful blowing of nose, explosions and loud noises, such as those encountered in aeroplanes or in boiler works, diving in contaminated waters (swimming hole earaches) excessive quinine and salicylate medication and direct trauma should be avoided. In acute purulent middle ear involvements, a prompt and proper paracentesis of the drum may save the hearing. The usual conservation of hearing following an early mastoidectomy is most gratifying.

The field of otology has long seemed to offer little which was gratifying to patient and physician, outside of a few measures like mastoidectomy, paracentesis, and removing cerumen; while efforts to help the deaf usually proved futile and

useless. Not so long ago the idea prevailed that little or nothing could be done to prevent a child with defective hearing from becoming a deaf adult. It must be remembered that in treating chronic deafness in adults we are tackling the problem from the wrong end.

We know now that we must detect and elim-

inate the underlying causes early in life. Regular periodic examinations in our schools where we can reach all of our future citizens will, if properly followed up, reduce the incidence of the serious economic handicap resulting from reduction in hearing to a fraction of its present alarming proportions.

HEALTH CONDITIONS IN THE UNITED STATES

In a report recently made to Congress, Surgeon General H. S. Cumming states that reports of the prevalence of communicable diseases received by the Public Health Service from State health officers and preliminary reports of deaths from several sources indicate that the health record for the United States for the calendar year 1930 was exceptionally good. The record for the first half of the year 1931 was also generally good, although an epidemic of mild influenza during the early months of 1931 increased the death rates for a time and gave the year an inauspicious beginning.

The geographic distribution of smallpox in the United States is very irregular. Seven states—Kansas, Delaware, District of Columbia, Maine, Maryland, New Hampshire and Rhode Island—reported no cases of smallpox in 1930. The greatest prevalence of smallpox in that year was in South Dakota, with 259 cases per 100,000 population. Indiana reported 164 cases of smallpox per 100,000 population, and the State of Washington 152 cases per 100,000 population.

During the calendar year 1930 the incidence of influenza in the United States was unusually low. The death rate from influenza for the year 1930 was 18.7 per 100,000 population as compared with 54.6 per 100,000 population in 1929 and 42.1 in 1928. The fact that there was no general outbreak of influenza during 1930 probably helped greatly in keeping the general death rate for the year low, as there is usually an increase in the number of deaths attributed to certain other diseases when influenza is prevalent.

Infantile paralysis was more prevalent during the calendar year 1930 than it was in 1928 or 1929. In the spring of 1930 the reports showed increased incidence of infantile paralysis on the Pacific Coast, and later considerable numbers of cases of the disease were reported in other parts of the country, especially in Louisiana, Oklahoma, and some of the North Central States. In the country as a whole, infantile paralysis reached its peak for the year about the first of October. An outbreak began in New York City soon after the close of the fiscal year. This outbreak later reached considerable proportions, the number of cases being considerably in excess of those reported for the preceding year.

The tuberculosis death rate for the calendar year 1930 was the lowest ever recorded by the Public Health Service. It was 68.5 deaths per 100,000 population as

compared with 73.1 in 1929 and 76.4 in 1928. In 1900 the Bureau of the Census recorded a death rate from tuberculosis of 201.9 per 100,000 population. The difference between the tuberculosis death rates of 1900 and 1930 represents a saving of more than 160,000 lives in 1930 which would have been lost from tuberculosis in the United States if the 1900 rate had prevailed that year.

The prevalence of typhoid fever has been decreasing in the United States since comparable yearly statistics of cases and deaths have been available. During the calendar year 1930 a slight reaction was shown by the reports. The increase was reported during the last six months of 1930 and in some States at least it may have been influenced by the drought conditions which resulted in pollution of water supplies or necessitated the taking of drinking water from new or unknown sources. The typhoid fever rates as computed from reports to the Public Health Service were as follows: 1930, 22 cases per 100,000 population; 1929, 19 cases; and in 1928, 22.7 cases.

The case and death rates for diphtheria in 1930 were the lowest which the Public Health Service has ever recorded—54.2 cases and 4.9 deaths per 100,000 population. Ten years ago, 1930, the diphtheria case rate was 155 per 100,000 and the death rate was 15.3 per 100,000.

From 1924 to 1928, there was an increase in the prevalence of pellagra in the United States. In 1929 the reported incidence of the disease decreased somewhat, and there was a further decrease during the year 1930. During the first six months of 1931, however, 16,385 cases of pellagra were reported to the Public Health Service as compared with 13,359 cases reported during the first six months of the preceding year.

More than 1,450 cases of undulant fever were reported to the Public Health Service for the calendar year 1930. The disease has been recognized in every State of the Union.

Rocky Mountain spotted fever is not reportable in many of the States east of the Rocky Mountains. In 1930, 167 cases were reported from California, Colorado, Idaho, Montana, Nevada, Oregon, Washington and Wyoming. During the year workers of the Public Health Service identified, by laboratory and clinical studies, Rocky Mountain spotted fever, eastern type, in several States along the Atlantic seaboard. There is evidence to indicate its existence in this area, at least since 1909. In 1931 cases were reported in the District of Columbia and Maryland.—U. S. P. H. S., Dec. 28, 1931.

THE INJECTION TREATMENT OF HEMORRHOIDS: SOME FALLACIES AND COMPLICATIONS*

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FROM being the orphan among medical specialties, the past ten years has seen proctology emerge as the Cinderella of the golden slippers. Never before in the history of specialization has there been such a sudden rise to popularity. I believe this unusual interest to be due very largely to the aggressiveness of certain individuals who are giving short courses in proctology on a commercial basis. The average physician has had little instruction in proctology and is anxious to increase his knowledge of the subject. This being the case, he is a ready victim for some plausible individual, who, for a fee of \$200 to \$500, promises to give a complete course in the diagnosis and treatment of rectal diseases, all in the period of a week or two. The inference is made that the subject is so easy that this short course is all that is needed and treatment is so simple that no further observations are essential to learn all that is necessary to know.

When seriously considered, these inferences and claims, of course, are ridiculous. Complications may arise from any form of therapy and a fellowship in proctology at the Mayo Clinic or the University of Pennsylvania requires three years of study.

The subject usually most stressed in these courses is the injection treatment of hemorrhoids. This is probably because hemorrhoids are the most common of rectal affections and because the hypodermic injection of a solution into the pile seems a most simple matter. Because the procedure is so easy and seemingly harmless there is resulting a crop of unnecessary complications and incomplete cures. These patients are then coming to the surgeon asking surgical relief, being convinced that the injection method is a failure. This is to be regretted for the injection method is of great value provided the operator knows how to use it and knows its limitations and the complications which may arise. It is the purpose of this paper to point out

a few practical facts concerning the injection method of treatment and to call attention to certain complications which one is almost certain to encounter if he has a large enough series of cases.

The theory of the injection treatment of hemorrhoids is the injection of a solution either directly into the substance of the pile, *i.e.*, an interstitial injection or the injection of a solution just underneath the mucosa above and covering the hemorrhoid. In either case the result is usually a thrombosis of a portion of the hemorrhoidal vessels and an inflammatory reaction which when replaced by scarification obliterates the varicosities. If it is kept in mind that this is the change which is brought about, many complications can be avoided.

Type of Pile to Inject.—The only type of pile suitable for injection is the internal hemorrhoid, which, when injected, will remain above the internal sphincter muscle. *No other type should ever be injected.*

Solution.—In the past escharotic solutions were commonly used for injection with the idea of producing a slough. At present milder solutions are used with the idea of producing an inflammatory reaction but avoiding slough. A slough is considered an undesirable complication. Enough irritation to produce fibrosis is all that is needed to produce a cure. Quinine urea hydrochloride (5 per cent) or phenol (20 per cent) in equal parts of glycerine and water are satisfactory. For submucous injection 5 per cent phenol in Wessons or olive oil is best. There are exponents of both methods of injection. We use both, the interstitial type of injection for the very vascular hemorrhoids and the submucous injection for those less vascular, and especially where the hemorrhoids are associated with some prolapse of the rectal mucosa.

The average amount is from 1 to 2 c.c. of quinine urea hydrochloride, 5 to 10 min. of the 20 per cent phenol solution and 2 to 5 c.c. of the 5 per cent phenolized oil solution. Of course,

*Read before the Southern Minnesota Medical Association, Faribault, Minnesota, August 24, 1931.

more may be used in some cases, but it is better to err on the side of too little. Too large an amount of solution is one of the most common causes of complications.

Injection.—If the patient is to be active two areas are sufficient for one injection. If the patient has a sedentary occupation or is not working, the complete ring may be injected at one sitting. It is safer to inject a smaller number.

Too frequent injection is also a very common cause of complications. Most texts and papers state that the hemorrhoids should be injected every three to seven days. This is a serious mistake. The period between injections should not be governed by time. The only criterion is the condition of the hemorrhoid. If there is induration still existing from the previous injection it should not be reinjected. Whether it be a day or a month one should wait until the induration has subsided.

The minimum time under favorable circumstances in which a cure may be promised is four weeks. We prefer to take eight weeks. If speed is necessary surgery is more certain, and I believe safer.

There is no way of telling in advance exactly how many treatments may be necessary to produce a cure in a given case of hemorrhoids. We can only be sure that a case is actually cured, when, upon examination, after all induration has subsided, no hemorrhoids are present.

Complications.—Usually these are not of serious character although fatalities may occur.

Most patients complain of some pain. Any pain, however, which is more than a dull ache and lasts more than a few hours should be classed as a complication. Severe pain usually results from injecting the solution too low down, that is, into an anal or external hemorrhoid. In some cases this pain may be severe and continuous for from three to ten days. Pain also may follow a slough, especially if the slough is near the ano-rectal junction. Pain is also present where an abscess forms, complicating the injection.

Slough is probably the most common complication. Personally, I would not believe anyone who does any considerable number of injections and says he never had a slough. Usually the slough is superficial and no ill effects are noted. In fact, unless an examination is made, neither the patient nor the physician is aware that it has

occurred. It is usually caused by the solution being injected too superficially or in too large an amount, or the injection being made into a hemorrhoid which is still indurated from a previous injection. While sloughs are usually of no permanent consequence they may be severe. Buie reports two cases where the tissues of both ischio rectal fossæ almost entirely sloughed away. Other complications which may follow a slough are hemorrhage, adenitis, fistula and septicemia.

Hemorrhage usually follows a slough. This is in most cases slight in quantity but an artery may be opened up which may produce alarming symptoms. A drop in hemoglobin to 40 or 50 per cent may occur. It is not always possible to tell when the bleeding begins as the blood backs up in the colon. The first intimation that a hemorrhage has occurred is a desire to evacuate the bowel. Then the patient may pass a pint or even a quart of blood. If one is unfortunate enough to have this complication occur, a speculum should be inserted, the bleeding vessel sought out and a stitch put around it. Anything less than this is a waste of time.

Occasionally an abscess instead of a slough may form. This may appear as a swelling near the margin of the anus and must be opened externally. In this case there is a complete fistula to deal with. At times nothing appears externally and a submucous abscess develops which breaks or is opened into the rectum. I have seen three cases where the slough or abscess as the case may have been, opened into the vagina producing a recto-vaginal fistula. I have been fortunate enough not to have this complication occur in any case I have injected myself, but where the recto-vaginal septum is thin from the lacerations of child bearing it is well to be very careful in injections on the anterior rectal wall.

With an abscess or slough adenitis may occur. I have seen the inguinal glands involved and I am sure that in some cases the deeper pelvic glands may also become involved. A temperature of 101 to 103 is not uncommon in these cases. In all cases I have seen, the inflammation has subsided without suppuration.

Liver abscess is a rare complication. Authentically, I know of but one case reported in the literature. In times passed this complication was brought forth as a "bogyman" by all opponents of the injection method. It occurs but seldom but it cannot be ignored.

A few very severe systemic reactions have been reported following the use of quinine urea hydrochloride. This is due either to an individual or familial idiosyncrasy to quinine. Rapid theadry pulse, prostration or syncope, with or without skin eruption, are the common symptoms. Severe reactions to phenol are more rare.

Strictures are of two types. The first follows extensive sloughs and is caused by cicatrization of the healing process. Needless to say, this is an avoidable complication. Rosser recently reported a stricture due to the use of a large amount of oil solution where globules of oil became encapsulated in areas of scar tissue.

Failure to secure a cure should probably not be classed as a complication. Yet it occurs so frequently it should be emphasized. It is due to but three things: the improper selection of cases, an improper method of the injection, or discontinuing the treatment too soon. The last named

is probably the most important.

In conclusion I want to say that this paper is not presented with the idea of discouraging any one from using the injection treatment of hemorrhoids. Rather it is a plea for a more thorough investigation and general understanding of the method that it may not be discredited by indiscriminate and improper usages. The operator should realize at the onset that the method is not as simple as it sounds and that a thorough understanding of all the processes occurring during the entire course of treatment is necessary if complications are to be avoided and good results secured. Lastly he should know the complications which occasionally arise even under the most careful treatment and know the best methods of dealing with them. With this knowledge the injection method will be found to be most satisfactory both to the patient and the physician.

THE INTRAVENOUS USE OF BARBITAL COMPOUNDS

The Council on Pharmacy and Chemistry reports that more than seven years have elapsed since the introduction of the intravenous use of barbitals, sufficient time to justify an assay of the possible value of the method. Since the chief object of the intravenous use has seemed to be the possible employment of barbitals used in this way to produce anesthesia, the Council reports on the possible changes following intravenous injection, a comparison of the experimental and clinical results, and attempts to determine if the intravenous use has peculiar advantages over other methods of administration, with equal safety. The Council points out that there is no doubt that the characteristic hypnotic action of the barbitals can be obtained by oral administration; that since the barbitals act essentially as hypnotics, and not as anesthetics, it is reasonable to entertain doubts about radical departures from the orthodox usage of these drugs, but the new methods

of using and new uses for well known drugs merit attention; and that, moreover, the intravenous use of barbitals has been widely exploited by some manufacturers and serious attention has been given to the subject experimentally and clinically. From an exhaustive review of the literature it is concluded that any advantages that may exist in the choice of barbitals as aids in anesthesia, or as sedatives, analgesics or hypnotics, can be easily procured by giving them by mouth, with the further advantage of avoiding the necessity of the small operation and aseptic technic for intravenous injection and the unnecessary disturbances and complications of such injections in general, and that about the only argument in favor of the intravenous route would be an occasional rapid action in an emergency, and that hence their intravenous use should be limited for the present to conditions in which oral administration is not possible or when a very prompt action is imperative. (Jour. A. M. A., December 19, 1931, p. 1886.)

SEVENTEENTH CENTURY PEDIATRICS*

AN ANTHOLOGY

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A DISCUSSION of the men who contributed to pediatric progress in the 17th century must give some consideration to the work done by their predecessors, both remote and immediate, as well as to the habits of thought of their contemporaries in other branches of science. Events political, economic and religious, difficult to interpret without reference to world conditions have a distinct bearing on the type and quality of scientific productions. There have been periods in history when statesmanship made great strides, while medicine failed to register any noticeable progress. An example is found in the closing years of the preceding century. Queen Elizabeth of England established herself as one of the greatest ministers of statecraft, furthering peace and cementing a firm government, but she gave little consideration to public health or encouragement to medical research. Her father, Henry VIII, is credited with the initiation of vital statistics. The beginning was simple. He ordered that the incumbent of parishes keep a true and exact record of marriages, christenings and deaths. Possibly he feared his own marital adventures might so influence his subjects that some form of national bookkeeping would be useful. Elizabeth enlarged slightly upon this idea, but no real progress was made until the appearance of the Black Death. While she dallied with her lovers she allowed to slip away her day of grace so far as motherhood was concerned, and so ended the reign of the Tudors. Had she encouraged medical progress, particularly therapeutics, she might not have had to take for her dropsy that terrible concoction of strange ingredients prescribed by Gilbert. Elizabeth, shortly before her death, made amends to Mary Stuart by nominating James for the Crown. This monarch brought many of his favorites with him from Scotland but retained a few counselors from Elizabeth's reign, including Cecil, Bacon and Gilbert. The latter continued to hold the position of Royal Physician. Gilbert

was more interested in physics than in medicine. It was in the first year of the 17th century that he brought out his epoch-making work on magnetism, the starting point of all subsequent work on terrestrial magnetic variations. Dryden's encomium, "Gilbert shall live until lodestones cease to draw," is still true. Such men exert a profound influence on the scientific thought of their contemporaries.

Among the many geniuses following Elizabeth's reign, none exerted a more profound influence on clear, concise thinking than Bacon. We should feel grateful for his influence upon Sydenham and Mayow. Kept in the background by his kinsman Cecil, he had little opportunity of demonstrating his power until the latter's death. His influence while he enjoyed royal favor and even after he was overthrown and living in forced retirement was a great stimulus and example to his contemporaries.

Civil disturbances in the latter part of James' reign and later under Charles I, culminating in the rise of Cromwell, did not interfere with scientific progress.

Moral and religious conditions, varying from the intolerance of Cromwell to the license of Charles, whose court was characterized as the "most scandalous in Christendom," encouraged a type of mental gymnastics which must have amused such men as Defoe, Dryden and others of the period.

It is conceivable that the disquieting time under James II was not improved after he ran away to Paris. William of Orange on his arrival from the Netherlands imposed many religious conditions which might easily have deflected the progress of scientific thought. While some possibly were intrigued or discouraged by politico-religious events, others found the times stimulating. This was not only true of physicians but of other outstanding characters. Certainly men like Butler, Bunyan and Milton found this period not altogether to their liking but the civic unrest did not retard their work. It was at this time that Wren rebuilt that portion of London which

*Presented at the Pediatric Seminar, University of Minnesota, June 10, 1931.

had been destroyed by fire shortly after the Black Death.

In Central Europe, at the beginning of the 17th century, conditions were ripening for the Great War. Religious agitation, continuous for more than seventy years, finally culminated in the storming of the Council Hall at Prague. This incident started the Thirty Years War in much the same manner as a comparatively trivial event precipitated the World War. During the war and the years of reconstruction that followed, the German people found conditions little suited for the advancement of science, particularly medicine.

The politico-revolutionary movement begun in England spread in much the same fashion as the Reformation. In general, the effect was as varied as the races of the countries in which it struggled for recognition. The result was to stifle the progress of science except in the more phlegmatic countries like England, Holland and bilized.

Isolated exceptions were encountered in other countries even in the first years of the century. In France, where the institution of royalty had been consolidated to a point which made the monarchical structure seemingly imperishable, little consideration was given to child welfare. Cruelty to children was a national crime. This naturally led to a reaction which resulted in certain laws regarding the abandonment of children and the development of such movements for their welfare as that instituted by St. Vincent de Paul. The early years reveal the name of a French physician, Ballou or Ballonious. While he was active at that time his works were not published until after his death. He was much interested in the influence of climate and season on the prevalence of epidemic diseases. His article on whooping cough is quoted in Rurah's *Pediatrics of the Past*. This remarkable character wrote, as did Sydenham, in much the same vein as Hippocrates. He was called by Crookshank the first epidemiologist of modern times.

Conditions in America were not propitious for the development of medicine. Jamestown, the Plymouth colony and the New Netherlands naturally drew to them a number of European physicians, who, as in Russia, were active agents in advancing the interests of legitimate medicine. Prominent among these were Bohun, Pot, Samuel Fuller, who came over on the Mayflower, John Winthrop, Jr., and Thomas Thatcher. The

latter was the author of the only medical publication printed in the North American colonies in the 17th century. This contribution was the "Brief Rule to Guide the Common People of New England How to Order Themselves and Theirs in the Small Pox or Measles." Thatcher, in addition to his medical work, found time to become an excellent scholar in Hebrew and Arabic. He was also the first pastor of the old South Church in Boston.

The greatest name in 17th century medicine is that of William Harvey (1578-1657) of Folkestone in Kent. He was educated at the King's School, Canterbury, and was nominated to a scholarship preparing one for medicine at Cambridge.

Padua had been the greatest school of medicine for some time and Harvey went to that place which Vesalius and others had made famous. The University was governed largely by the students of the different nationalities. Harvey was chosen councilarius, an office which John Finch said entailed being "drunk at least forty times in the year." The teacher who had the greatest influence upon Harvey was Fabrica. This teacher, who performed his dissections in the amphitheater by candlelight, was greatly interested in the mysteries of the circulation. He demonstrated the valves in the veins and made many notable contributions to the subject of development. While Harvey made no direct contribution to pediatrics his work on "De Motu Cordis" produced a definite and far reaching effect. The crux of Harvey's argument as described by Garrison—"that the actual quantity and velocity of the blood, as computed by him, make it physically impossible for it to do otherwise than to return to the heart by the venous route"—was the first application of the idea of measurement in any biologic investigation. "Had he chosen to express his discovery in the language of algebra it would have taken its proper place in the application of mathematical physics to medicine. The importance of Harvey's work is not so much the discovery of the circulation of the blood as the qualitative or mechanical demonstration." With this start physiology became a dynamic science.

From the pediatric point of view the most interesting contributions of the 17th century were made by Walter Harris (1647-1732). His book on "Acute Diseases of Infancy" was referred to

by Sydenham as one which "may be of more service to the public than all my own writings." In that treatise he broke away from the popular Hippocratic pathology of humors and affected the acid diathesis of Sylvius, viz: that "all the symptoms of gastro-intestinal disorders owe their origin to acid products in the body." He extended the concept of infancy beyond the classical three months of Galen to the fourth year, and extended the period of childhood to fourteen years.

The difficulties and discouragements of pediatric practice made a deep impression upon Harris. He believed "that the cure of a sick child was as much to be desired as anything in the whole Art of Physic, and of consequence not only to the nobles, wealthy and powerful, but to parents of any rank whatsoever." He discoursed at length on the value of history and observations obtained from nurses, upon the hereditary influence in children's diseases, the importance of correct diet, and the advisability of limiting opiates and wine. Concerning the latter, however, he held different views regarding its use in later life. He insisted upon specific directions, noted the seasonal appearance of diarrhea and painted gruesome pictures of marasmus and convulsions. His book held its place for 100 years, or until Underwood's work supplanted it. While Harris was not as great a physician as some others of his time, he was a shrewd, honest practitioner of pediatrics, a keen observer who taught simplicity, caution and common sense.

A far greater name is that of Thomas Sydenham (1624-1689). He was not a pediatricist, but a general practitioner, a man without hospital connections or official office of any kind, not even a Fellow of the Royal College, yet he left his imprint upon medicine for all time. He revived the Hippocratic method of observation and experience. In fact, he stands as a representative of the clinical and bedside approach to the problems of disease, just as his contemporary, Harvey, stands as a prototype of the experimental investigator.

Sydenham had little patience with the laboratory or with research, largely, Reisman believes, because of the preposterous claims and fanciful theories resting upon meager data. The scientific theories of the time were of little value to him at the bedside. He relied upon his powers of observation and his fund of experience.

Sydenham had a late start in his medical career. He was born of Puritan parentage in Dorsetshire, a place called by Lord Clarendon "the most malignant spot in England." It is not strange that this Roundhead felt impelled to leave Oxford to take service in the Army. Later he returned to Oxford, but took his degree at Cambridge at the age of fifty-two.

There had been sporadic instances of accurate descriptions of disease before the time of Sydenham. Glisson had given his classical description of the English disease, and Mayow, the greatest genius of the century, had shown evidence of his powers of observation and deduction, but Sydenham was the first real clinician of modern times to observe and record the progress and treatment of disease. He drew sharp distinction between acute and chronic disease. He laid much stress on bodily disposition, age, sex, season and climate, and their influence on the course of disease. His description of gout and stone (he suffered from both), and of smallpox are unsurpassed. He is credited with being the first to describe and name scarlet fever. He did not, however, recognize the sore throat or the fact that it was contagious. He introduced the so-called cooling treatment, used the bark discovered by the Jesuits in the treatment of ague and invented the mixture not unlike our wine of opium, called Sydenham's laudanum. He believed that a patient making satisfactory progress should be let alone and not drugged. He pointed out that the secondary manifestations of epidemics varied from time to time and that one complication was more prominent at one time than another.

In Sydenham's last work on the appearance of a new fever, appears his masterly description of chorea. While not as accurate as his work on gout, it is the study by which he is best known.

What Sydenham's attitude toward experimentation might be today we can only surmise, but he surely was not reactionary in temperament and would have undoubtedly welcomed every aid to his understanding of disease.

I have just named John Mayow (1643-1679) as the greatest genius of his time. But he was a neglected genius. During his life he did not attain the position he should have held and even now he is comparatively unknown. His recognition of oxygen and of combustion led to his remarkable work on respiration. This work was

influenced by Lower, the brilliant experimental physiologist, on whose skillful dissections much of the reputation of the more famous Willis rests. He showed that the maternal blood supplied the fetus with oxygen as well as food. His work in chemistry was brilliant. His death at the age of thirty-six is said to have delayed the advance of modern chemistry more than a century.

From a pediatric standpoint his description of rickets is of interest, especially that portion which deals with diagnosis. His observations, presented in terse, short sentences, are remarkable when compared to the verbose reiterating style of Glisson.

Francis Glisson (1597-1677) was one of the brighter lights of English medicine in the 17th century. His work on the anatomy of the liver will always be remembered as his name is associated with the capsule. He was the first to use the word and the idea of "irritability," which means so much to modern physiology. His work on rickets is the foundation of our knowledge of this disease. Some consideration may well be given to the limited knowledge of rickets existing in Glisson's time.

Whether rickets was to be considered a modern disease or whether it was equally prevalent centuries before was a subject for much discussion. Statements by Greek and Roman philosophers and physicians which seemed to refer to this disorder are not sufficiently precise to convince one that they did not refer to some other disease accompanied by deformity of the bones.

The most remarkable feature in relation to the history of rickets was the sudden appearance, or at least marked increase in incidence in the 17th century. To such an extent was this manifested in England that a commission was appointed with Glisson at its head to gather reports and communications relative to the disease.

Glisson's publication was preceded by five years by a little book written by Daniel Whistler after that worthy had been elected "in an evil hour" to the presidency of the College of Physicians. The fact that this man had heard of rickets rather than studied it is fairly evident from his book. At least one other mention of rickets had been made previously, namely, an article by one Arnold De Boot, a Dutchman serving in the English army.

Glisson had as his collaborators six men, all members of the College of Physicians. They col-

lected papers and communications made at private meetings and attempted to edit the material. When Glisson had interwoven his part containing many views differing from those commonly held, they committed the whole work to him in order to avoid deformed and misshapen statements. His work comments on the antiquity of the disease, dwells on the fact that it is not luetic in nature, devotes chapters to anatomical observations before the body is opened and after, gives a long account of the changes in the bones, with resulting deformities, speculates on the causes, including diet and "such things as are taken inwardly," puzzles over the fact that it is not observed until the sixth month, refers to its association with other diseases, especially scurvy, and gives a good account of the signs and symptoms. His therapy was that of the period.

This lengthy report reminds Ruhrah of the remark that Milton's *Paradise Lost* is a fine work but no one has been known to wish it one line longer.

The work is a monument to Glisson's powers of observation and description and is so complete that, apart from the information afforded by technic not at his disposal, little has been added since.

The name of Robert Pemell (?-1653) is not among the great in English medicine, yet he made a valuable contribution to pediatric literature by his book on "Diseases of Children" and later by a popular treatise entitled "Help for the Poor." In this he established himself as being in the vanguard of welfare workers. It considers the diseases of children, particularly those common among the indigent. It shows him to have been a pioneer among those interested in the prevention of infant mortality. His therapy employed was the usual absurd remedies of his day, but included baths, the external use of wine and of sulphur for suppurating skin diseases. All of his remedies had the merit that, if they did not help, they did not harm.

His chapter on worms shows that many of the symptoms now attributed by the laity to this infection are not of recent origin but existed during his time. After citing a number of these vagaries he closes his chapter on diagnosis with the statement that "The most certain sign of all is when they void worms in the excrement." He was an author of merit, a technician of ability, a pediatric thinker in some ways ahead of his

time and one of the early workers in the field of infant welfare.

If we were to consider Francis Sylvius (1614-1672) solely from his pediatric work we would do rank injustice to this great man. He wrote a little pediatric text in "Familiar style for weaker capacities" which was published in Amsterdam and later in London. In it is combined a treatise on rickets. It contains much common sense, but some absurdities, most of which are a reflection on the time rather than the man. He is best known as an anatomist, his name being connected with at least five portions of the brain. He also was a brilliant teacher, physiologist and clinician. Students from all over Europe flocked to his clinic at Leyden, among them Willis, who concentrated on the study of the brain, aided by the neglected Lower, De Graff of the graffian follicles, Stensen, Swammerdam, who described the red corpuscles, and Van Horn of thoracic duct fame. No student of the time who had not attended his dissections felt that he knew anatomy. His method of clinical instruction has been much quoted and is followed by many of the great teachers of today. Naturally, with the limitations of his time, many of his concepts were incorrect, but he gave a great impetus to medical observation and thought.

To credit all the men who contributed indirectly to the progress of pediatrics in the 17th century would require some discussion of most of the physicians whose names still live, and many outstanding characters in other sciences. The progress made was not limited to the cure of the child but included social and cultural aspects as well. Painters who previously had used children only for religious pictures were awakened to their artistic possibilities. Musicians and sculptors for the first time recognized the child as an asset. Previous to the time of Hugo, the child occupied an infinitesimal place in literature.

From a pediatric standpoint the effect of the 17th century workers can be classified under three heads:

1. The recognition that the life of a child might be worth saving. This was a new concept. Development of the movement we know as infant welfare really began in this century.

2. The influence of Harvey which resulted in an age of specialized anatomic research which was notable for its long array of individual discoveries and investigations, nearly every one of which had a physiological significance. This was responsible for the immediate advancement of medicine, yet it contained much faulty philosophy. Its votaries were primarily philosophers and secondarily physicians.

3. The effect of the school of Sydenham, which actually observed and recorded the progress of disease. It was responsible for the development of clinical medicine.

To us, the influence of colonial medicine on the type of practice existing in America for a long period following this era is interesting. This was due, Garrison believed, to two factors: (1) the youth who studied with a physician under indentures of apprenticeship received actual bedside instructions from the start; and (2) under primitive frontier conditions the medieval antagonism between the physician and surgeon soon disappeared for the necessary and sufficient reason that the frontier doctor was called upon to meet any emergency, surgical, obstetrical and medical. As Handerson says, "Many of these apprentices doubtless proved as successful physicians as some of their more fortunate colleagues who boasted an M.D. of Leyden, Aberdeen or Cambridge and 'Slew their patients' "Secundum Artem." We may agree with the same authority that, from this period on, American medicine acquired the eminently practical tendency which has been its chief merit.

CASE REPORTS

FRACTURE OF THE TEMPORAL BONE REPORTS OF TWO CASES WITH UNUSUAL SEQUELÆ

JOHN F. CURTIN, M.D., and
LAWRENCE R. BOIES, M.D.
Minneapolis

Involvement of some portion of the temporal bone in skull fracture is common. The more serious injuries in which the temporal bone chiefly is concerned, usually involve the petrous portion.

The main types of temporal bone fracture can be briefly classified as follows:

I. Longitudinal

(a) Usually run along the anterior border of the pyramid beginning in the anterior fossa or in the region of the Gasserian ganglion, and ending in the tegmen antri or tympani and external auditory canal. The facial nerve may be involved.

(b) Posterior to the pyramid and involving chiefly the mastoid process and bony covering of the lateral sinus.

II. Transverse

Comparatively rare. Cross the pyramid at right angles and usually at the weakest portion, the region of the vestibule. Unless the lateral wall of the inner ear is involved, which is rare, hemorrhage from the ear does not result.

III. Avulsion of the tip.

Very rare. This type should not affect the inner ear but may cause injury to the nerves at the internal auditory meatus.

Labyrinthine fractures show a tendency to close by fibrous instead of bony union, and therefore a late meningeal infection from the middle ear is an ever present possibility.

Objective examination of the auditory and vestibular function reveals the seriousness of the injury as far as damage to the temporal bone alone is a factor.

The following cases of skull fracture involving the temporal bone are of particular interest because of their unusual sequelæ:

Case 1.—A six and one-half year old girl was hospitalized in a semi-conscious condition on September 3, 1930, an hour or two after being struck and knocked to the pavement by an auto. Examination revealed a fractured ankle and multiple body bruises in addition to a bleeding left ear with ruptured membrana tympani. She seemed totally deaf in the injured ear; the escape of cerebrospinal fluid was not noted. A basal skull fracture was suspected although the plates taken of the skull (stereoscopic lateral) were negative. She was seen on the day after her injury by Dr. Curtin at the request of Dr. T. W. Weum.

Her general condition improved during the following week, but she complained of pain in her left ear. No significant neurological symptoms were evident; she had been conscious since a few hours after her admission to the hospital. The fractured ankle had been reduced and immobilized; her bruises healed. A sero-sanguinous discharge from the ear on the day following injury had developed a mucopurulent character with

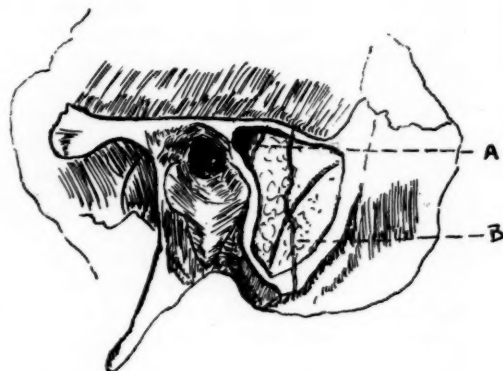


Fig. 1. Diagrammatic representation of site of fracture lines, A, Case 1; B, Case 2.

an increase in amount. Moderate pressure over the cortex of the mastoid elicited considerable tenderness.

On September 12, a partial left facial paralysis was noticeable. No other significant signs were evident except a slight increase in the amount of discharge. The X-ray examination indicated a pneumatized left mastoid, clouded, and without definite evidence of cell destruction. There was a rise in temperature on the next day to 101 degrees (mouth); the facial weakness was more marked and she complained of pain over the left side of her head. There was also some sagging of the postero-superior canal wall. The leukocyte count was 19,000. Her febrile manifestation is indicated on Chart I (only the morning and evening temperatures are recorded, as they show the general trend, though four hour temperatures were kept).

On September 14, left simple mastoidectomy was performed (Dr. Curtin). Considerable destruction was evident especially about the antrum in the region of the zygoma and toward the solid angle. A line of apparent fracture was observed extending through the tegmen of the antrum. All cells were exenterated.

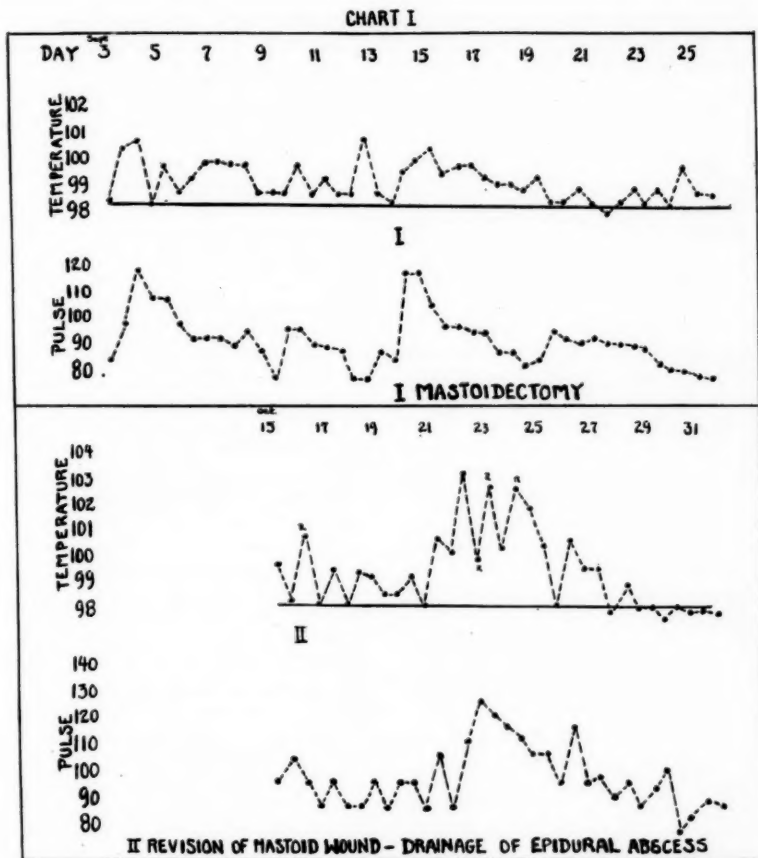
Convalescence was uneventful. The facial weakness completely cleared and she was discharged home on the twelfth day after operation. At the time of discharge, however, the middle ear, which at first had

been dry following operation, was again discharging a little, and she complained at times of a dull left sided headache.

There followed an eighteen day period at home.

which was drained. The lateral sinus plate was also removed from knee to tip; the sinus appeared to be normal.

The post-operative course was marked by some im-



During the first week slow improvement was noted. In the second week, she was feverish at times and there was an increase in the frequency and severity of headache over the left temporal area. She was readmitted to the hospital on October 15, at which time her temperature was 101 degrees, there was an increase in discharge from the middle ear, and drainage from the post-aural wound, and she complained bitterly of headache. The white blood cell count was 13,000. Dr. H. B. Hannah saw her in consultation; the neurological examination was negative for evidence of intracranial disease or meningitis.

A secondary mastoidectomy was performed on October 16. There was evidence of delayed healing in the wound. No cellular structure was noted. The line of fracture traversing the tegmen of the antrum was again observed. At this site, an area of dura over the middle fossa was uncovered revealing a large epidural abscess,

mediate improvement. Her headache was relieved but did not entirely disappear. Toward the end of the first post-operative week it became more severe. The temperature curve is shown on Chart I. On October 21, there was a sudden rise in temperature to 101 degrees (mouth). On the next day she complained continuously of severe headache; a stiff neck and a positive Kernig reflex had developed. A lumbar puncture revealed a cloudy spinal fluid under 28 mm. of mercury pressure and a cell count of 2,275, ninety-five per cent of which were polymorphonuclears. No organisms were found on smear or culture. For two days her condition remained about the same, the temperature being elevated and headache severe. She vomited several times. Another spinal puncture, on October 24, showed marked improvement of the spinal fluid with a cell count of 611.

Gradual improvement followed; she left the hospital on November 1. Subsequent examination showed an

intact left ear drum completely healed, a healed post-aural wound, total deafness in the ear and no evidence of vestibular abnormality. On August 1, 1931, she was in excellent general health.

This case illustrates the longitudinal type of fracture involving the petrous portion of the temporal bone, with fracture line through the tegmen of the antrum. The absence of vestibular phenomena would suggest that the fracture involved the cochlea, inasmuch as complete deafness resulted in the affected ear. If deafness was due to injury of the eighth nerve in the internal auditory canal, one would expect evidence of vestibular disturbance. The absence of escaping cerebrospinal fluid from the ear points toward no injury at the internal auditory meatus, as it is here that the meninges are prolonged into the meatus, and a tear in them with rupture into the subarachnoid space accounts for the escape of cerebrospinal from the ear in these cases.

The development of an otitis after this injury is accounted for by infection of the middle ear through the eustachian tube. The probable effusion into the mastoid of blood and serum following injury formed an excellent medium for suppuration to start.

The later development of the facial paralysis in presence of evidence of a suppurative otitis media rather indicates that this was due directly to the infection and not to anything cerebral. It is certain that there was no involvement of the facial nerve directly from the injury or there would have been some indication of it at that time. The onset eight days after the injury, with the most significant symptoms at that time related to an otitis media, is conclusive evidence that the paralysis was directly the result of the suppurative process. This is supported also by the subsequent course of events.

The manner of development of the pathological process that followed the mastoidectomy must in part be a matter of speculation. The location of this epidural abscess indicates the probability that the break in bone at the site of this abscess was a definite factor in its occurrence, although epidural abscesses are not uncommon complications of middle ear infections without temporal bone fracture.

Dr. Hannah believes that the symptoms following drainage of the epidural abscess, and the spinal fluid findings, indicate that a small intracerebral abscess developed which ruptured and drained into the subarachnoid space. This seems the most logical conclusion.

Case 2.—A six years old boy was admitted to the Pediatric Service of Dr. E. J. Huenekens at the Minneapolis General Hospital on April 28, 1931, an hour after he had been struck by an auto. He was still unconscious. Except for a few superficial bruises, some dried blood in his nose, a little fresh blood in his nasopharynx, and the presence of bilateral Babinski reflexes, his examination on admission was negative. He vomited several times during the next twenty-four hours.

He was still unconscious on the following day. There was evidence of a partial left facial paralysis.

A lumbar puncture showed a spinal fluid pressure of 250-340 mm. of water, and blood due to the puncture.

During the following week, he continued to be unaware of his surroundings, but could be partially aroused and was irritable when touched. Consultation by the neurological and surgical services failed to elicit additional signs of any significance.

Gradually he became brighter. The facial weakness cleared. On May 21, he had developed measles and was transferred to the contagious ward. On June 2, a myringotomy was done on the left ear drum. No secretion was obtained.

His temperature rose to 105 degrees on June 6 (Chart II). The ear had begun to discharge pus. The patient rapidly developed a toxic appearance and seemed to be losing strength. An X-ray examination indicated destruction of the left mastoid. It was also noted that there was a line of lessened density just posterior to the tip of the mastoid and running superiorly and inferiorly, which suggested a possible fracture in this region.

A simple mastoidectomy was performed on June 8 by Dr. Boies. On retracing the periosteum over the cortex, a fracture line was noted, the course corresponding to B, Figure 1. The cortex was removed with gouge and curette, revealing a mastoid in coalescent stage. All cells were exenterated. When the bony plate over the lateral sinus was exposed, a fracture line could be seen crossing diagonally throughout. The sinus was uncovered. As the plate toward the tip was removed, pus welled up from a large perisinus abscess. At this point a portion of the lateral sinus wall, apparently necrotic, gave way when sponged and profuse bleeding followed which was controlled by an iodoform plug inserted in the space between the bony wall and the compressed sinus. Because of the presence of a phlebitis, and a probable thrombosis, as well as for the control of hemorrhage, a left internal jugular ligation was performed at this time. The mastoidectomy was then completed and the sinus packed off above the iodoform plugs.

The post-operative course was not particularly encouraging during the following week. On the third post-operative day, the sinus packs were removed but had to be replaced as complete thrombosis from the torcular end had not taken place. In three more days they were removed without further bleeding. A transfusion was also given. The temperature continued to be elevated and the patient's general condition did not improve.

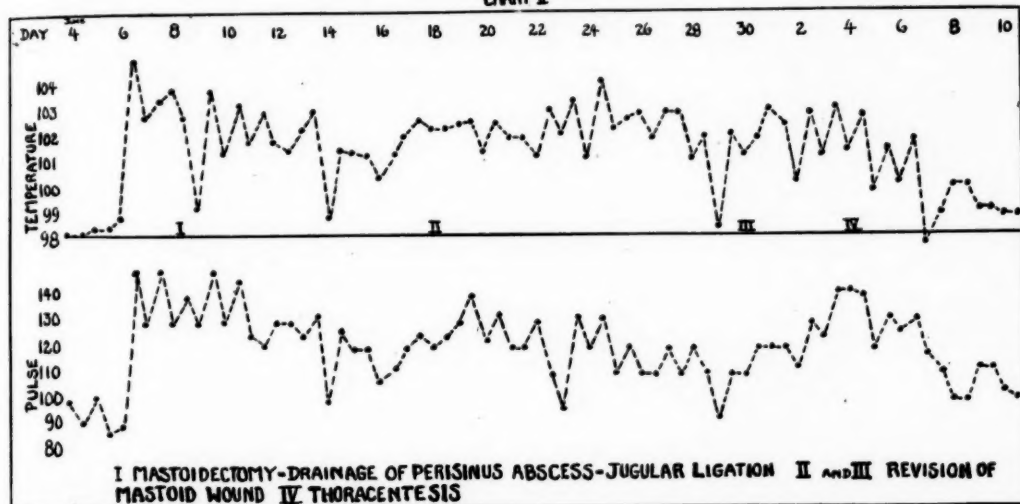
On June 18, the mastoid wound was explored in search of the cause of his apparent general sepsis. Repeated general physical examinations were negative. There was little evidence of healing. A portion of the tegmen of the mastoid was removed at the site of the fracture line. The dura was injected; a small amount of granulation tissue covered it over the area exposed. This bled easily. No pus was seen. Further exposure of the lateral sinus was made by uncovering toward the torcular end. The central portion of the sinus had become obliterated and the portion toward the torcular

end appeared healthy. There was nothing significant toward the bulbar end.

The post-operative course again was not encouraging. He continued to be rather drowsy, irritable when

and was able to leave the hospital on August 5. An abscess at the site of an hypodermic puncture in his left deltoid muscle had delayed his discharge from the hospital.

CHART II



touched and the temperature remained elevated (Chart II). A bilateral positive Kernig reflex and some neck rigidity were elicited. Lumbar puncture revealed a normal spinal fluid pressure, a cell count of 22, eighty-five per cent of which were polymorphonuclears, and no organisms. Dr. J. C. Michael of the Neurological Service thought that he had an early meningitis. A myringotomy was performed on the right ear because of a thickened membrane tympani; no secretion was obtained.

On June 30, the mastoid wound was again explored. The patient had continued to be critically ill and repeated general physical examinations by Dr. Huenekens and others had revealed nothing to account for his continued symptoms except the aural disease. At this operation (Dr. Curtin and Dr. Boies) a larger area of dura in the middle fossa was exposed by removal of the tegmen of the antrum and of the mastoid. The bone seemed to be very soft and devitalized. The whole mastoid cavity indicated that there had been little evidence of healing. Additional soft bone was removed in front of and behind the lateral sinus. The thrombosed sinus was incised and a portion of the clot removed from both ends; it appeared to be healthy.

On the day following this operation, chest symptoms developed, with elevation of pulse and respirations. His temperature continued elevated as shown in Chart II. Signs of fluid developed and on July 4, 100 c.c. of clear yellow fluid was withdrawn from the right pleural cavity.

A period of gradual improvement followed. He was given three transfusions during the following month

There was no evidence in this particular case, from an otologic standpoint, that the petrous portion of the temporal bone had been involved. The injury through the mastoid process probably resulted in the presence of serum and blood within the mastoid as a direct result of the injury. However, the development of an otitis in this case may not have been influenced by the local injury, inasmuch as the injury was followed by an attack of measles.

The fracture through the lateral sinus plate was undoubtedly a factor in the development of this perisinus abscess. There was evidence also that the infection reached the meninges above the fracture line through the tegmen of the mastoid. This probably was a prominent factor in the symptoms subsequent to the initial operation.

The appearance of chest signs occurred after the final operation on the mastoid. Repeated general physical investigation over a three week period between the initial and final mastoid operation had failed to reveal anything to account for the symptoms of that period. It is reasonable to assume, therefore, that they were the result of infection within the mastoid and its environs. Experience with similar cases in which areas of devitalized bone had to be removed before healing resulted, leads us to the belief that the final removal of all involved bone with wide exposure of the adjacent meninges was a definite factor in the recovery.

COMMENT

In cases of head injury with suspected fracture of the temporal bone, objective examination of the auditory and vestibular function indicates the seriousness

of the injury as far as the temporal bone is concerned.

The development of a middle ear infection following fracture involving the petrous portion of the temporal bone, with extension of the fracture into the middle ear, or tegmen of the antrum, or following fracture of the mastoid portion alone involving the pneumatized portion or sinus plate, demands especially careful observation for signs of more serious complication which might arise due to the break in the bone. It is generally agreed that early intervention is indicated under these circumstances when signs of mastoid infection develop.

Persistent attention to the mastoid wound is necessary when symptoms of sepsis or delayed healing are evident and contributing causes elsewhere have been ruled out.

TUBERCULOUS PERICARDITIS

REPORT OF A CASE WITH RECOVERY

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Tuberculous pericarditis, while more common than is generally thought, probably occurs less often accompanying a childhood infection than an adult infection. Autopsy statistics show that in 25 per cent of all cases coming to post-mortem examination there is some tuberculous lesion present; in 1 per cent, tuberculosis of the pericardium has been found. Norris reports 82 cases of pericardial involvement in 1,780 autopsies on known tuberculous patients. Others report similar figures, averaging from 4 to 7 per cent. German figures show pericardial involvement in tuberculous children to be about 3 per cent.

Although tuberculous pericarditis is occasionally a primary lesion, it is usually a secondary infection and a coexistent pulmonary, bone, visceral or mediastinal lymph node involvement can be found. It must be remembered that there is a free communication between the pericardial cavity and the peritoneal and pleural cavities by way of the lymph channels.

The symptoms of tuberculous pericarditis are obscure and the diagnosis depends upon the finding of the primary lesion or definite evidence of a tuberculous infection. The patient has fever, a few chills, usually dyspnea and pain, which can be traced to the sensory fibers of the phrenic nerve. The pain may be sharp and stabbing, heavy or cramping; it may be directly over the heart, the manubrium or on the left side of the neck or shoulder.

The physical findings show widening of the area of cardiac dullness, and an X-ray will show widening and obliteration of the normal heart shadow. Change of position from the sitting to the recumbent posture will evidence a shifting of the area of dullness. A decrease in pulsation can be seen under the fluoroscope. Signs of lung compression at the angle of the left scapula, such as bronchial breathing and dullness, are usually present. A friction rub may or may not be heard. Removal of fluid for smear and animal inoculation will aid in the diagnosis. A fluid which is hemorrhagic or

purulent should make one suspect tuberculosis. The quantity usually varies from 150 to 1,000 c.c. and is light amber to greenish-yellow in color.

The course of the disease is from several weeks to months, with development of circulatory symptoms, emaciation, continued fever, anorexia and signs of the concomitant tuberculosis. The prognosis is reasonably good.

Treatment in the main consists of strict bed rest and careful dietetic supervision. The results of aspiration alone are not encouraging and if the fluid is moderate and causing no discomfort thoracentesis is not indicated. When the heart shows signs of being crowded, pneumopericardium can be used and good results have been reported by several workers, such as Meyer, Castex, Wenckeboch and Oppenheimer. The use of air and lipiodol is recommended by W. Ackermann with report of good results. Lemaire also reports the use of lipiodol injection favorably. Pericardotomy has been practiced and brings about a drainage into the spaces surrounding the pericardium. Without surgery, resorption takes place gradually and can be promoted by the use of diuretics.

CASE REPORT

J. S., a male negro boy, aged 8, was admitted to St. Mary's Hospital, Duluth, October 26, 1929, with sore throat, cough, pain in the chest, loss of appetite and fever 100.8. These symptoms had been present for 10 days.

Past History: Negative.

Family History: Mother living and well. Father died of pulmonary tuberculosis; one sister at a sanatorium, with childhood tuberculosis; one brother, aged 4, died of tuberculous meningitis. Paternal aunt died of pulmonary tuberculosis.

Physical Examination: Negative except for chest, which shows impaired resonance over the left lower chest and axilla and showers of râles at both bases. Heart tremendously enlarged to percussion and a friction-rub present.

Laboratory Study: X-ray taken showed heart tremendously enlarged with definite pericardial effusion. No definite evidence of tuberculosis present.

Urine normal.

Sputum negative on seven occasions for tubercle bacilli.

Blood: R.B.C. 3,500,000; W.B.C. 5,800; Hgb. 70 per cent; calcium 17 and 15 mgm.

Electro-cardiogram: Inverted T wave.

Spinal fluid: Colloidal gold—111,222,000.

Course in Hospital: The patient's temperature remained around 101 and pulse 90 to 120 during his stay in the hospital. An attempt to aspirate the pericardium was made December 5, 1929, but no fluid was obtained.

On January 30, 1930, the von Pirquet test was positive and followed by a temperature of 103.

The patient had occasional short tetanic convulsions at seven to ten day intervals which would last about five minutes. A pericardial friction rub persisted during his stay. He was kept strictly in bed and given symptomatic treatment.

On June 24, 1931, the patient was transferred to Nopeming Sanatorium, where he was kept on bed-rest for eight months and then exercise was gradually stepped up so that now the child is attending school

parenchyma and absence of other etiologic factors, we feel sure that this is a case of tuberculous pericarditis even though no fluid was obtained to clinch the diagnosis.

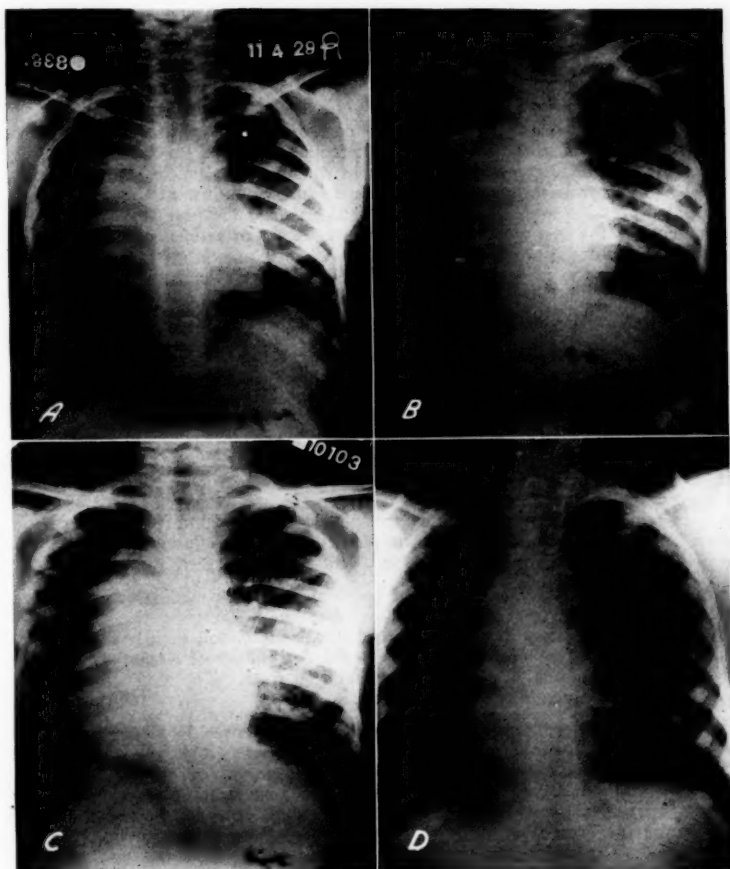


Fig. 1. X-rays showing progress in size of heart. View A was taken November 4, 1929; B, January 1, 1930; C, June 11, 1930; and D, June 6, 1931. View D shows tuberculous infiltration at the left upper edge of the hilus.

and goes to his meals. Sputum has always been negative for tubercle bacilli. The heart shadow has been closely followed by X-ray and a gradual return of the heart to normal size has taken place, exposing at its left upper edge a parenchymal lesion, undoubtedly tuberculous in nature.

The patient had two or three convulsive seizures after admission to the Sanatorium, the last occurring in October, 1930.

Temperature and pulse have returned practically to normal. Treatment has been symptomatic, plus rest, diet and sun therapy.

In view of the suggestive history and findings in this case plus the adjacent tuberculous lesion in the lung

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PRESIDENT'S LETTER

WE READ in various articles that the cost of medical care is beyond the means of the average man, meaning of the "white collar group" or of "the great middle class," and that something must be done about it. In many articles the inference is quite plain that the doctor is the chief cause of this. Just or unjust at this accusation may be, the medical profession must face it, and, if it is true, do the best possible to correct it or, if it is untrue, do the best possible to disprove it. A recent article in the American Medical Association Bulletin (December, 1931) by Dr. A. H. Freiberg, past president of the Ohio State Medical Society, is well worth reading. Doctor Freiberg marvels, as many of us have, at the social philosophy that apparently insists that the chief relief needed by members of the great middle class is reduction of the cost of medical service for them and their families. No mention is made of, or remedies offered for, the really fundamental abuses affecting this group. What might be called socialization of medical service for the poor in one form or another, particularly in densely populated areas, is already accomplished. Socialization of medicine beyond that point is contrary to the fundamentally sound economic structure on which our country has developed and is not in accord with American ideals. Dr. E. S. Judd, president of the American Medical Association, in an article in the same issue of the American Medical Association Bulletin as that in which Doctor Freiberg's article appeared, pointed out that there are sound reasons for believing that the so-called high cost of medical care is over-rated, and that, owing to its elasticity, the cost of ill-health is in reality pretty well within control of the combined efforts of the patient and his physician in most instances. In the recent period of general inflation, hospital costs and the wants of the individual patient soared along with everything else.

It is only natural that a difference of opinion as to how medicosocial problems are to be met should develop between those who make their living in the actual practice of medicine and those engaged in preventive medicine, such as full time health officers. There never has been any difference of opinion as to the desirability of education in public health, of the institution of means to prevent disease, and so forth. The medical profession is and always has been solidly behind such measures.

However, this difference of opinion has been misinterpreted by many laymen to mean that the attitude of the mass of our profession toward these problems is one of indifference, and that the credit for delivering to the public the benefits of medical advance must be given to the social worker. We know this is not true; nevertheless, many have such an impression, and some of those who have it are truly friendly to the medical profession. The only answer is for organized medicine, through its representatives, to take the lead in all matters pertaining to public health.

Freiberg also aptly pointed out that, owing to the large number of measures which are directly or indirectly of importance to our profession and which are proposed for enactment in our legislative bodies, it has become necessary for organized medicine to be represented at every legislative assembly in the United States. This activity, not agreeable so far as it smacks of lobbying, may be rendered less obnoxious to us if we regard it as our fulfilling of a trust reposed in us, because the special knowledge we possess marks us as best fitted to know what is to the best interest of the public in matters pertaining to health. There is no evidence that this trust has been abused.

M. S. Henderson.

President,
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

Official Journal Minnesota State Medical Association,
Southern Minnesota Medical Association, Northern
Minnesota Medical Association, Minnesota Academy of
Medicine, and Minneapolis Surgical Society.

Owned and Published by
The Minnesota State Medical Association

Under the Direction of Its

EDITING AND PUBLISHING COMMITTEE

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Subscription Price: \$3.00 per annum in advance. Single Copies 25c. Foreign Countries \$3.50 per annum.

Vol. XV FEBRUARY, 1932 No. 2

CHOICE OF ANESTHETIC

The ideal anesthetic should entirely obviate pain, should be attended by no mortality or deleterious effects on any organ of the body and should be unaccompanied by complications. Have we such an anesthetic? No.

The discovery of the anesthetic properties of both ether and chloroform about the middle of the nineteenth century was a great boon to humanity. Chloroform, being pleasanter to take and requiring a less amount, soon became the more popular of the two. In recent years it came to be recognized generally that chloroform

is definitely more dangerous than ether, not only because of the immediate mortality but because of late toxic effects.

Because of the definite disadvantages accompanying the use of ether—its explosibility, post-operative vomiting and occasional pulmonary complications—repeated efforts have been made to develop substitutes. Nitrous oxide has proven a good substitute for short operations but is decidedly more dangerous for prolonged anesthesia. Ethylene gas, a recent development, though possessing a less pleasant odor, is easier to inhale and is much less likely to be followed by vomiting. If it were not for the fact that it produces less relaxation and is also highly explosive, ethylene would come close to being the perfect inhalation anesthetic. Rightly it has largely supplanted ether.

Local anesthesia fills the bill for many surgical needs. Novocain, the drug most commonly used, is suitable for a great number of operations, especially where inhalation anesthesia is undesirable. Undoubtedly enthusiasm has led to an overextension of its field of usefulness. This has been particularly in evidence in the German clinics. Enthusiasts with well developed technic which includes nerve blocking have known no limit in their successful use of local anesthesia, but there is no question that for the general surgeon its use should be restricted.

The various more recent substitutes, scopolamine and morphine hypodermically, avertin rectally, and amytal intravenously, have in common the objection that an overdose leaves the surgeon helpless. The mortality rates with these drugs are higher and for this reason they should not and have not come into general use.

The rapid adoption of spinal anesthesia is a contradiction of the oft heard accusation that the medical profession is averse to the adoption of new methods. There are those who feel that spinal anesthesia has had too general adoption. The advantage of the resultant relaxation, greater than with any other anesthetic, is more than counterbalanced by the high mortality, the lack of control of the anesthetic action, the frequency of post-anesthesia headache and lower-

ing of blood pressure which at times is alarming. The attending mortality is distinctly high and for this reason alone spinal anesthesia should be used in a restricted field by those who are well acquainted with the technic of administration.

In selecting an anesthetic, the patient deserves the entire consideration. His safety and comfort are of prime importance. Psychic trauma is real. Overenthusiasm for an anesthetic in preference to all others is a mistake. Selection should be made to suit the indications in the individual case.

SEVERE ANEMIAS—RECENT LITERATURE

Few medical subjects provide greater present interest than the field of hematology. Those who have followed the ideas and attitudes of laboratorians and clinicians for the past twenty-five years realize that the morphologists and symptomatologists have had their research and clinical innings in repeated sequences, where the game has been lively and the scoring heavy. Unit or dual origins of blood elements continue to hold less attention than the Hippocratic background of constitution, in which the bone marrow has offered the fundamental position.

The clinician who fails to sense this is likely to be lost while guiding himself by such supposedly "fixed harbor lights" as minus indices or attention to uncorrelated blood counts. For those who do not see a fair number of anemic patients the confusion in the literature is accentuated, because it is apparent that the atypical cases soon come to assume such frequency that they ultimately establish the basic principles involved rather than the "regular run of the mill."

The temptation is great (as has been shown by Watkins) to assume a pseudo- or pre-pernicious anemia category: individuals with low counts, achlorhydrias and hypochromasia. Dameshek¹ has recently discussed this type, but finds little difference in the "hyperplastic (sternal) bone marrow" except as to the microcytic or megalocytic cellular elements.

With this slight differentiation he might well infer that these severe hypochromasic anemias could well be a type or earlier stage of true

Addisonian anemia. In any case, they seem to need iron, either because of faulty digestion and assimilation, with inadequate hemoglobin synthesis, or from other unknown factors; in any case, the present day heroic iron dosages are firmly established. This would obviously run counter to the older attitude concerning the futility of iron exhibition in pernicious anemia, because the tissues are often suffused with iron, the apparent result of extreme blood destruction. All the studies in tissue therapy (liver, stomach wall, kidney, etc.) concentrate upon the general idea that in active pernicious anemia the immature blood cells extruded into the circulation are either physiologically insufficient or defenseless against physiological removal; hence, it might be that a severe anemia in the hypochromasic stage might call for iron; if it should extend into the state of perverted and muddled bone marrow capacity, the resultant blood destruction might bring other needs to the foreground, exclusive of iron.

In this order Cassel,² with his ingenious feeding experiments, gradually draws our attention to the vital products eliminated or synthesized in the gastric wall. It would appear that his studies will greatly help to allocate to the clinical findings of degree and type of gastric secretion the true and accurate position of this vital phenomenon in the anemias as a whole. Whatever his "intrinsic factor" proves to be, it now seems to be entirely independent of the other measurable substances known to exist in normal gastric juice. While this is a qualitative factor, the "extrinsic" feature is quantitative, and has to do with the amount of meat or other protein upon which the intrinsic substance has had its action.

It is to be hoped that the unnecessary technicalities may be gradually disposed of and we may come to have a wholesome appreciation of the manner in which the gastrointestinal tract on the one hand balances off with pabulum and stimuli the effectiveness of the bone marrow system; likewise, the manner in which secretion as a whole is determined or inhibited by the central nervous system. In any case, the circulating blood may or may not furnish the criteria which

¹Dameshek, W.: Primary hypochromic anemia (erythronormoblastic anemia). A new type of idiopathic anemia. *Am. Jour. Med. Sci.*, 182:520.

²Castle, W. B.; Heath, Clark W., and Strauss, Maurice B.: Observations on the etiologic relationship of achylia gastrica to pernicious anemia. IV. A biologic assay of the gastric secretion of patients with pernicious anemia having free hydrochloric acid and that of patients without anemia or with hypochromic anemia having no free hydrochloric acid, and of the role of intestinal impermeability to hematopoietic substances in pernicious anemia. *Am. Jour. Med. Sci.*, 182:741 (Dec.), 1931.

indicate correctly how these other vital functions are carrying on. There would appear to be sufficient indication to justify an intensive drive to better understand bone marrow. Does any one think he knows much about it? It is time to proceed from a simple static attitude to an attempt to fathom its dynamic possibilities.

E. L. T.

MEDICAL HISTORY

The recent visit to the Twin Cities of Professor Henry E. Sigerist, Director of the Institute of Medical History, Leipzig University, has emphasized to the professional as well as to the lay mind the vital necessity of a philosophical background for anyone who is to attain proper eminence in the field of medicine. Dr. Sigerist spoke before the American Historical Association and was a guest at the winter meeting of COS-CNIDUS, a society which has for its object the congenial pursuit of the cultural and historic aspects of medicine. The reasons prompting the desire of the few to study the history of medicine should also stimulate the many to thought along these lines.

We are today, in this century, perhaps very near the crest of a golden age of scientific and mechanical achievement. There has been so much of factual and material addition to our lives, and in so short a space of time, that one stands a little dizzily upon the heights achieved with our hands, heights not, as yet, entirely realized by our imaginations. The advance has been so rapid, especially in science, that we have almost broken with the past. Our giant stature has dwarfed for us the preceding centuries, partly has made us forget our inherited debt and creates an illusion of self-sufficiency that is, perhaps, a little vulgar. Such a condition stirs memory and rouses a sense of danger so that once more it seems as if, in the words of Sir Thomas Browne, "'Tis opportune to look back upon old times and contemplate our forefathers."

Four hundred years ago science began to divorce itself from the church, up to that time the accepted vehicle of all cultural endeavor. Under its influence thought had become inelastic, dogmatic and altogether removed from practical living. The method of science, dispassionate inquiry into unrelated facts, felt more and more the necessity of separating itself from the rigid

formulas of scholasticism, since the latter threatened to blot out its very existence. One of the first effects, as the breach grew wider, was an increasing decentralization of thought and deed. Authority and unity of command meant a stifling of thought, so that every effort was made to escape this on the one hand and, on the other, to strengthen the freedom of action of the individual. In addition, structural thinking was cast overboard, and the experimental method alone came to dominate the field.

The culmination of the movement was seen in the early years of the present century, when the civilized world presented the picture of thousands of widely spread laboratories and clinics in which innumerable investigators were engaged in piling up, with unflagging patience, a staggering array of unrelated facts. At the same time the reaction against authority had reached its height, so that one beheld the spectacle of men who, in contiguous laboratories, and working on the same problem, often resolutely refused to concede even a tittle of merit to each others' efforts. Contempt for precedent and organization led inevitably to this result. In divorcing himself from the past, in working alone, many an investigator and clinician paid the inevitable price of such isolation. His world of mental vision narrowed, healthy skepticism became suspicion, and personal experience, lacking the leaven of a wider culture, instead of serving truth too often resulted in mere prejudice and provincial ignorance. John Hunter's dictum, "Don't think, try," was followed with a thoroughness that unfortunately left little to be desired. Our library shelves sag with the results of this furious pursuit of facts, and while the trying thousands yearly add to the indigestible load, the occasional Pasteur, thinking as well as trying, creates magic. Together with the very real achievements of the few there has thus grown up a great army of little people who, unchastened by the discipline of thought or contemplation of the past, threaten the very science they seek to serve.

Thus we begin to realize that in overthrowing the already accomplished instrument of philosophic method we have, so to speak, thrown away the child with the bath water. We are surrounded with data innumerable and appear unable to synthesize them. The danger is real and the cry for correlation arises from more than one great university. To a large extent, present

day investigators and clinicians of the highest type have seen the problem and are facing it. Obviously there are many roads of approach to its solution and of these that of historic method is not the least.

To this end, then, among others, the study of the history of medicine serves splendidly and in its pursuit one may hope not only to relish great minds and great accomplishments, but also, perhaps, to achieve a little humility.

H. LONGSTREET TAYLOR

Some in an early stage of their medical careers have a vision of a goal worth while. Too often distractions cause a letting up in endeavor or a diversion from the chosen path.

Longstreet Taylor became Dr. Longstreet Taylor in 1882, by coincidence the same year that the German physician Dr. Robert Koch made his outstanding contribution to medical science—the discovery of the tubercle bacillus. Dr. Taylor was content with nothing less than a year spent in Berlin under Dr. Koch.

Upon his arrival in Saint Paul in 1893 Dr. Taylor began devoting his energies to the fight against the scourge of tuberculosis, especially in his city and state. Article after article on the subject appeared in the local journal—the Northwestern Lancet. He toured the state in an effort to arouse public interest. He appeared repeatedly before the state legislature. He was the pioneer and the leader in the hard up-hill fight in those earlier days when both the public and the medical profession had to be convinced of the necessity of a departure in methods of treatment of tuberculosis if success was to be achieved. Few knew of his expenditure of energy and time and even of his private means in the pursuit of his main objective—the elimination of tuberculosis.

It was not until the year 1918 that the statistics in this state began to indicate that the foe was beginning to yield. Dr. Taylor lived to see the mortality rate of tuberculosis more than cut in half. With a tireless carrying-on of the work he started there is no reason why this still dreaded disease cannot be practically eliminated just as other similar scourges have.

Dr. Taylor aroused the antipathy of some physicians by his insistence on the necessity of public

care of those afflicted with tuberculosis. Experience has vindicated the correctness of his viewpoint. Many were his friends both within and without the profession and many feel the real loss of his going.

MISCELLANEOUS

SOCIAL INSURANCE IS CONTRARY TO THE FUNDAMENTAL PRINCIPLES OF DEMOCRATIC GOVERNMENT*

EDWARD H. OCHSNER, M.D.

Chicago

All forms of Social Insurance are contrary to the spirit of democratic government. They destroy individual incentive, initiative and self reliance. They substitute paternalistic control for independence of thought and action. We pride and congratulate ourselves on living under a democratic form of government but most of us fail to realize that we are slowly but surely drifting away from the true democratic spirit in government—that we are gradually substituting a hybrid form of government, a cross between bureaucracy and socialism. Personally, I am a firm believer in democracy and believe that many of our present ills are the direct result of already having deviated too far from the fundamental principles of democracy.

Individual responsibility is the foundation of democratic government. If a nation does not educate its citizens to individual responsibility, it will soon have no one capable of assuming public responsibility. Slowly through the ages the common man has risen from chattel slavery and serfdom to independence, freedom and personal liberty, and now some well-meaning but misguided people want to undo all this. They want to enslave him again, making him in fact a bondsman of the state. Organized society is forever forging new chains with which to shackle the free development of its members. It is forever meddling with the private affairs of its citizens. One of the best illustrations of this statement is found in a recent survey of the Citizens' Bureau of Milwaukee which found that that city is engaged in approximately three hundred different functions, one-fifth of which have been added during the last sixteen years. Milwaukee is no worse in this respect than many other cities in this country. Add to this the activities of the county, state and federal governments, and we find an explanation of the following fact: "In a period in which the population of the United States has increased ten per cent the number of

*One of a series of articles appearing in state medical journals on various phases of socialized medicine.

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persons holding civil office has increased forty per cent and the amount paid in salaries has increased one hundred and fifty per cent." Thirty years ago one person in every forty-five was in government employ while now one in every twelve is so employed.

"It is a profound mystery why the people of the present generation should so violently run after the very things their forefathers so violently ran away from in 1776. One of the chief indictments of King George set forth in the Declaration of Independence reads: 'He has erected a multitude of new offices and sent hither swarms of officers to harass our people and eat out their substance.'"

In a recent article, Dr. Harry Emerson Fosdick makes a statement that seems particularly suitable in this connection. He said, "Many of those in society who are dissatisfied with present conditions know what they want to get away from, but they do not know whither they are going." I would add, "nor do they seem to have any clear idea as to what they want." Before we adopt new laws we should make reasonably sure that such laws will not introduce new and greater evils than they are expected to cure, that they can actually be enforced, and that they are not likely to be abused in their administration.

A far reaching innovation such as Social Insurance must be viewed from many angles. We must consider its effect upon the general public, the insured, the employer, and the medical and dental professions.

If we are deliberately trying to get away from the democratic form of government, having a definite objective in view, and if we are reasonably certain that the goal for which we are headed is worth while and is going to result in general social and economic betterment, an experiment with Social Insurance might be justified, but, even then, it is well to carefully weigh and consider what the wise founders of our government had to say on this important subject. I quote from the Declaration of Independence, "Prudence, indeed, would dictate that government long established should not be changed for light and transient reasons." If we as a nation are just aimlessly drifting, as we seem to be, we are almost sure to get into serious trouble. We believe that we shall be able to show conclusively, in future articles, that in those countries in which it has had prolonged and extensive trial it actually has had serious consequences. These latter problems will be taken up in subsequent articles.

CULTIVATION OF "COMMON COLD" VIRUS

The growing conviction that "common colds" are not due to any micro-organism thus far included in commercial vaccines, but to an unknown filtrable virus or group of viruses, is strengthened by the currently reported successful cultivation of bacteria-free pathogenic nasal filtrates. The work indicates conclusively that the filtrable agent associated with "common colds" multiplies or is multiplied in the embryonic tissue medium. (Jour. A. M. A., August 15, 1931, p. 466.)

OBITUARY

John Benson Brimhall

1862-1931

Dr. J. B. Brimhall, Saint Paul, was born July 4, 1862, on a farm located now within the city limits of Saint Paul between Randolph and St. Clair, Snelling and Hamline Avenues. Here his parents had moved in 1851.

After attending the public schools in Saint Paul he enrolled in 1886 in the St. Paul Medical College located on West Ninth Street. Upon its discontinuance the next year he entered the University of Pennsylvania medical school, where he graduated in 1890. Upon graduation he opened an office in the Moore Building at Seven Corners, Saint Paul, where he was associated with his friend, Dr. Arthur J. Gillette, for twenty-three years.

During the early years of his practice he was assistant city physician, taught in the Hamline University Medical School, and later was on the teaching staff of the University Medical School. Staff membership included St. Joseph's and St. Luke's hospitals among others.

On January 26, 1891, Dr. Brimhall became a member of the Ramsey County Medical Society and retained his membership in the county, state, and national organizations until his death December 21, 1931.

He was Executive Secretary of the State Board of Medical Examiners from 1897 to 1901 and during this period devoted considerable time to the Legislature in the interests of legislation for the betterment of medical practice.

On September 24, 1890, Dr. Brimhall married Miss Nellie Nabon. A son and three daughters were born before Mrs. Brimhall's death in 1903. Later he married Mrs. Laura Matthews, who, with his three daughters, Mrs. Carlton C. Brainard, St. Paul, Mrs. Oswin Reeves, Minneapolis, and Mrs. Frank Daniels, Long Lake, Minnesota, and one step-daughter, Mrs. Colin MacDonald, St. Paul, survive him.

As a statement in his county society records: "Quiet and unassuming in nature, his record will not be found on the pages of medical journals or textbooks but is graven deeply in the hearts of his friends, and his patients were his friends."

Henry Longstreet Taylor

1857-1932

Dr. H. L. Taylor, Saint Paul, was born in Cincinnati, Ohio, August 14, 1857, and died at his home January 2, 1932, at the age of 74. He attended Haverford College at Haverford, Pennsylvania, and received his medical degree from the College of Ohio, now the University of Cincinnati, in 1882.

It was in 1882 that Dr. Robert Koch discovered the tubercle bacillus and the subject so intrigued Dr. Taylor

that he went to Berlin, where he spent a year working with Dr. Koch. The next two years he spent at Prague, and returned to practice in Cincinnati. Poor health necessitated his moving to Asheville, North Carolina, where he practiced for four years, coming to Saint Paul in 1893.

Dr. Taylor joined the Ramsey County Medical Society May 1, 1893, and the same month read the first of a number of papers before the society on the subject of tuberculosis. He became secretary of his county society in 1894 and on retiring in 1895 made a plea for the founding of a medical reference library. Dr. Taylor was appointed on the committee which led to the forming of a library association and eventually to the taking over of the library by the society in 1897.

Interested in tuberculosis from the beginning of his medical career, on arriving in Minnesota Dr. Taylor began a publicity campaign in the interest of anti-tuberculosis fight, making addresses in various parts of the state. His untiring efforts were largely responsible for the authorization of a state sanatorium in 1903 which was opened at Walker in 1907. His private tuberculosis sanatorium at Pokegama, opened in 1905, has the distinction of being the first sanatorium in the state.

In 1906 the Association for the Prevention of Tuberculosis was formed as a private undertaking in Saint Paul and a county tuberculosis camp was established in 1910 at Cuenca on the shore of Lake Owasso. On this property the county Preventorium was later established in 1915.

In 1913 the legislature passed the County Sanatorium Bill which provided state subsidy for county sanatoria. It was not until 1918 that the mortality statistics showed the results of the fight against tuberculosis. But Dr. Taylor lived to see the death rate from tuberculosis more than halved.

Dr. Taylor was one of the members of the first editing and publishing committee of MINNESOTA MEDICINE and served until 1923, when he was appointed Councilor of the State Association. He was president of the Minnesota Public Health Association from 1924 to 1927 and president of the National Tuberculosis Association in 1928. The Trudeau society of Minnesota honored him with a dinner at the time of his presidency in 1926. In March, 1928, a dinner sponsored by the Lymanhurst medical staff was tendered him at the New Nicollet Hotel in Minneapolis.

At the time of his death Dr. Taylor was chairman of the Children's Preventorium and the Pokegama Sanatorium, a member of the Minnesota Club and the Minnesota Academy of Medicine. Surviving him are his widow and three children, Henry L., Jr., Laura and Louise Nicolich of New York.

Dr. Dudley C. Frise

1887-1932

Dr. Dudley C. Frise, of Minneapolis, died unexpectedly Sunday morning, January 10, 1932, while resting after playing two chukkers of polo at Fort Snelling rid-

ing hall. Death was due to heart disease.

Dr. Frise had lived in Minneapolis since his graduation from the medical college of Northwestern university in 1904. Previously he had attended the University of Minnesota, where he was the youngest student ever to enter the school of pharmacy. He was born in Hamilton, N. D., in 1887.

Active in civic affairs, Dr. Frise was a member of the Minneapolis Athletic club, president of the Exchange club, a director of the Salvation Army, and the Boy Scout advisory council. He was also a member of the Minneapolis Red Cross chapter, and the Fort Snelling Polo club.

Surviving him are his wife; a brother, Melvin Skews Frise of Minneapolis; a sister, Mrs. T. Arthur Prichard, and two children by a previous marriage, Richard and Geraldine.

Dr. F. G. Watson

1871-1932

Dr. F. G. Watson, 60, a resident of Nobles county for more than twenty years, died at his home in Worthington, Minn., Monday, January 11, 1932, following an illness of nearly two years.

After coming to Rushmore in 1910 Dr. Watson practiced medicine continuously there and in Worthington until January 14, 1930, when he was stricken with a heart attack during an operation. He was then forced to retire and had been in a serious condition since.

Frederick Goodwin Watson was born in Ireland, December 23, 1871. He came with his parents to New York in 1884 and after spending a summer in New York, they moved to western Canada, locating on a farm 125 miles west of Winnipeg. He took up the study of pharmacy in 1890, attending the University of Manitoba. In 1896 he came to Wood Lake, where he opened a drug store. During McKinley's administration he was postmaster there.

In the fall of 1898 Dr. Watson took up the study of medicine at Hamline university. After completing the medical course there he located at Clarkfield, where he practiced medicine and conducted a drug store.

In 1910 he moved to Rushmore and remained there until 1918, when he came to Worthington, associating himself with Dr. B. O. Mork. They operated the old Humiston hospital under the name of Mork & Watson. In 1920 they organized the Worthington Clinic. Dr. Watson was active in interesting other men in the Clinic and in the construction of the office building.

In 1921 Dr. Watson took post-graduate work in Chicago and at Tulane university in New Orleans.

He married Miss Isabelle A. Tibbils on September 1, 1897, and to them five children were born: Horace Percy Watson of Worthington, Dr. Leo Watson of Parkersburg, Ia., Dr. Sidney J. Watson of Worthington, Donald G. Watson of Worthington and Mrs. Bernice Ann Maxwell of Sioux Falls. The children and Mrs. Watson survive, as do also one sister, Mrs. R. S. Butchart of Greensboro, N. C., and two brothers, James Watson of Minneapolis and Ernest Watson of Wauwatosa, Wis.

OF GENERAL INTEREST

The Brigham hospital at Watkins, Minnesota, has been reopened for patients due to the numerous calls for hospital service in the community. Dr. F. T. Brigham is in charge.

Dr. C. Oliver Heimdal, formerly a fellow in surgery at the Mayo Clinic, was elected secretary and treasurer of the Aurora (Illinois) Medical Society at their last meeting.

Dr. Byron O. Mork, Jr., graduate of the University of Minnesota Medical School in 1930, spent the past year as interne at the Receiving Hospital, Detroit, Michigan, and is now associated in practice with the Worthington Clinic, Worthington, Minn.

Paul Fesler, superintendent of University Hospital, Minneapolis, has accepted the superintendency of Wesley Hospital, Chicago, affiliated with Northwestern University. Appointment of a successor to Mr. Fesler has not yet been made.

Dr. Louis B. Wilson, Director of the Mayo Foundation of the University of Minnesota, was recently elected President of the Association of the American Medical Colleges. More recently also he has been elected National President for two years of the Society of the Sigma Xi.

The John Phillips Memorial Prize of the American College of Surgeons for 1931 consisting of the sum of \$1,500 has been awarded to Dr. O. T. Avery of the Rockefeller Institute, New York City, for his series of studies on the pneumococcus. The award will be made at the meeting of the College at San Francisco in April.

Dr. B. F. Van Valkenburg, Long Prairie, was elected president of the Minnesota State Sanitary Conference at its annual convention in December. Dr. W. H. Valentine, Tracy, was named vice president; Dr. A. J. Chesley, Minnesota State Board of Health, secretary-treasurer. Drs. George Wattam, Warren, and H. M. Workman, Tracy, were elected life members.

Dr. Edward Bratrud of the Bratrud Clinic, Thief River Falls, has recently added to his Staff Dr. Lucien G. Culver, recently associated with Drs. Wheeler,

Larson, and Wold at St. Paul in the practice of Eye, Ear, Nose and Throat; also Dr. Charles W. Froats, who recently completed a two years' Fellowship in Gynecology and Obstetrics at the University of Minnesota.

The fourth annual high school Gorgas Essay Contest for high school juniors and seniors, sponsored by the Gorgas Memorial Institute, Washington, D. C., will open February 7 and close March 15. The subject of the contest is "Mosquitoes, Their Danger As a Menace to Health and the Importance of Their Control." High school winners will qualify in the State Contest, the prize to be \$10 in cash, and state winners will be entitled to enter the National contest, with a prize of \$500 in cash and a travel allowance of \$200 to Washington. Detailed information may be obtained by writing to Gorgas Memorial Institute, 1331 G Street N. W., Washington, D. C.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

CANCER "SPECIALIST" LEAVES STATE FOLLOWING
\$1,000.00 FINE

State of Minnesota *vs.* Boyd T. Williams

On Saturday, December 19, 1931, Boyd T. Williams, who for twenty years has maintained a cancer sanitarium in Minneapolis and in recent years at 525 University Ave. S. E., was sentenced to pay a fine of \$1,000.00 or to serve one year in the Workhouse in the City of Minneapolis, by the Honorable Arthur W. Selover, Judge of the District Court of Hennepin County. Williams paid the fine.

Defendant had been under arrest for some time following the filing of a complaint against him by Mr. Brist, representing the State Board of Medical Examiners. Williams was charged with practicing healing without a Basic Science Certificate. When Williams was brought before the Court to receive his sentence he informed the Court that he had closed his place and had removed his sanitarium to Hudson, Wisconsin, which fact has been verified by the State Board of Medical Examiners.

This is the third time that Williams has been convicted of violating the Medical Laws of this State since the enactment of the Basic Science Law in 1927. In 1913 Williams was fined \$50.00 by the Municipal Court of Minneapolis for practicing medicine without a license. In 1928 he paid a \$100.00 fine for practicing without a Basic Science Certificate. In 1929 he paid a fine of \$250.00 for a like offense.

The closing of this case and the removal of the defendant to Hudson, Wisconsin, should mark the end of Williams' practicing in Minnesota without a license.

ANNUAL SECRETARIES CONFERENCE

A record making attendance of close to one hundred physicians and others registered for the Annual Secretaries Conference of the Minnesota State Medical Association, Saturday, January 23, at the St. Paul Hotel in St. Paul.

The program, scheduled to last until 4 P. M., was prolonged until 6 P. M. to give time for discussion.

The three major events of the morning program included discussions of fee collection methods led by Mr. Albert Wilson of St. Paul; a recital of the work of the joint coöperating committees of the Minnesota Editorial and the Minnesota State Medical Association by Mr. Roy J. Dunlap, Managing Editor of the St. Paul Pioneer Press and Dispatch, and J. A. Watson, chairman of the Medical Association Committee, Minneapolis, and a symposium on Medical Care of the Poor under the chairmanship of Dr. Theodore Sweetser, Minneapolis, chairman of the State Health Relations Committee. W. C. Andrews, Frederic, Wisconsin, president of the Polk County Medical Society; Mr. Vernon D. Blank, Des Moines, general manager of the Iowa State Medical Society, and Dr. Harold M. Camp, Monmouth, Ill., secretary of the Illinois State Medical Society, reported on the systems in use in their respective states. The Hon. Henry Benson, Attorney General, commented upon possibilities of introduction into Minnesota of the contract system in use in Iowa and elsewhere for care of the poor.

The luncheon address on the subject "The County Society Turns the Tide against State Medicine," was made by Mr. H. Van Y. Caldwell, Cleveland, executive secretary of the Cleveland Academy of Medicine, with a discussion by Mr. Theodore Wiprud, executive secretary, Milwaukee County Medical Society.

The afternoon program was devoted exclusively to Periodic Medical Examinations and Medical and Hospital Care for Veterans, the latter occupying the major portion of the time.

Dr. C. A. Hensel, St. Paul; Dr. C. B. Wright, Minneapolis, and Dr. M. C. Piper, Rochester, discussed advisable extent and methods of public education for the periodic health examination.

Dr. Otho A. Fiedler, Sheboygan, Wis., president of the Wisconsin State Medical Society, outlined the history of the Shoulders Resolution for substitution of disability insurance for further government hospital building for veterans. A two-hour discussion of the situation followed, led by Dr. C. B. Wright, chairman of the Legislative Committee of the American Medical Association; Mr. Paul Fessler, president of the American Hospital Association; Dr. Herman Johnson, chairman of the Committee on Public Policy and Legislation; Dr. N. G. Mortenson, formerly president of the Forty and Eight; Dr. James J. Morrow, former Vice Commander of Minnesota American Legion, and Dr. H. R. Tregilgas, South St. Paul.

Many out-of-state visitors to the conference remained to take part in the Annual Northwest Regional Medical Conference which met informally Sunday, January 24, at the St. Paul Hotel. Nine states were

represented at this conference and more than fifty were registered in attendance in the course of the day. Sessions began with breakfast meeting at 8 A. M. and continued until 5:30 in the afternoon.

Among those who attended the meeting were Dr. Otho A. Fiedler, Sheboygan, Wis., president of the Wisconsin State Medical Society and retiring president of the Conference; Mr. Vernon D. Blank, general manager of the Iowa State Medical Society, secretary of the Conference; John L. Marker, Davenport, Iowa; Dr. L. R. Woodward, Mason City, Iowa; Dr. D. J. Glomset, Des Moines; Dr. R. W. Fouts, Omaha, Neb.; Dr. B. F. Bailey, Lincoln, Neb.; Dr. George Crownhart, Madison, Wis.; Dr. Earl Whedon, Sheridan, Wyo.; Dr. Harold M. Camp, Monmouth, Ill.; Dr. R. G. Leeland, Chicago; Dr. J. F. D. Cook, Langford, S. Dak.; Mr. H. Van Y. Caldwell, Cleveland, Ohio, and Mr. Theodore Wiprud, Milwaukee.

Minnesota representatives who attended the conference were Dr. E. A. Meyerding, St. Paul; Dr. C. B. Wright, Minneapolis; Dr. M. S. Henderson, Rochester; Dr. W. F. Braasch, Rochester; Dr. Herman Johnson, Dawson; Dr. H. M. Workman, Tracy; Dr. George Earl, St. Paul.

Medical economics, care of the indigent, lay health education methods and the budgeting of medical publications were discussed at length in the course of the day.

Dr. Cook was elected president of the Conference to succeed Dr. Fiedler. Mr. Blank was re-elected secretary. St. Paul was chosen again as next year's meeting place.

FOODS

The following products have been accepted by the Committee on Foods of the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in Accepted Foods:

Del Maiz Niblets Brand (Minnesota Valley Canning Company, Le Sueur, Minn.).—A "vacuum" packed canned whole-kernel corn containing no added salt or sugar and very little added water. It is claimed to be the canned whole kernels of a special breed of corn packed in vacuum to protect the flavor and processed with only a small amount of added water to retain the form of the original kernels.

Green Giant Brand Great Big Tender Peas (Minnesota Valley Canning Company, Le Sueur, Minn.).—Canned ungraded "fancy quality" Green Giant variety peas sweetened with sugar and seasoned with salt. This product is claimed to make an appetizing and easily digestible purée for infants.

SMACO (200) Whole Milk Sterilized (S. M. A. Corporation, Cleveland, Ohio).—A canned sterilized homogenized whole milk. It is recommended for all uses of whole milk and especially for infant feeding. (Jour. A. M. A., September 12, 1931, p. 780.)

Harvest Bread (Hecht's) (Hecht's Bakery, Bristol, Tenn.).—A white bread made by the sponge dough method. It is claimed to be a bread of good quality. (Jour. A. M. A., September 19, 1931, p. 853.)

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

*The Minnesota State Medical Association
Morning Health Service*

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of February will be as follows:

February 3—Personal Hygiene—Food Selection.

February 10—Buerger's Disease.

February 17—Prevention of Goiter.

February 24—Is Cancer Inherited?

AMERICAN COLLEGE OF PHYSICIANS

The sixteenth annual Clinical Session will meet in San Francisco the week of April 4, 1932. General Sessions will be held each afternoon, Monday to Friday inclusive and Monday and Tuesday evenings. Clinics and demonstrations will occupy the mornings.

The subjects to be emphasized will be the recent contributions to the fields of arteriosclerosis, hypertension, nephritis, the autonomic nervous system, gastrointestinal physiology, hematology, and diseases peculiar to the Rocky Mountain and Coast territory.

All physicians in good standing are invited to attend. The guest fee of \$15.00 includes one year's subscription to the *Annals of Internal Medicine*, the official journal of the college. Entertainment will be provided by the local committee for members of the families of those who attend.

Dr. S. Marx White, Minneapolis, is president of the organization this year and Dr. George Morris Piersol, Philadelphia, is secretary-general.

STATE MEETING

A program full of novelties and innovations is in process of completion for the 79th meeting of the Minnesota State Medical Association, which is, this year, to be held concurrently with the Minnesota Hospital Association at the new Saint Paul Auditorium, May 23, 24 and 25.

The Committee on Scientific Assembly wrestled for hours at its meeting January 16 at the Saint Paul Athletic club with the no less than 904 subjects suggested by the membership in an astonishingly large response to the questionnaire on scientific program sent out after the first meeting of the committee.

To comply with the largest possible number of these requests, the program is to be divided in an entirely unprecedented fashion. Table demonstrations for small groups will vie for time with the larger medical and

surgical sectional meetings and the general meetings to be addressed by distinguished out-of-state guests.

In order to arrange discussion and demonstration of as many of the requested subjects as possible within the limited available time the committee has decided to hold table demonstrations during three program hours of the session: from 10 to 11 a. m. Tuesday, from 2 to 3 p. m. Tuesday, and from 10 to 11 a. m. Wednesday. Twenty of the best qualified men in the state will preside at these demonstrations, which will be carried on, round table fashion, for small interested groups in the large exhibit hall. The scientific and technical exhibits on display in the hall will afford ample material to interest those who do not attend the demonstrations. Subjects already suggested for these latter include fungi; Ascheim-Zondek test; electrocardiograph; undulant fever; allergic skin tests; urine typing of pneumonia; X-ray of juvenile tuberculosis; gallbladder technic; tuberculin test; Schick test; blood sugar; blood urea; albuminuria; arthritis skin test; cauterizing the cervix; brain model; localization; X-ray of ulcers; eye grounds.

The large joint sessions of the program will be confined to Monday afternoon, Monday evening and Tuesday and Wednesday from 11 to 12 a. m. and from 1 to 2 p. m.

Medical and surgical sections will meet separately Tuesday and Wednesday mornings from 8 until 10 a. m. The entire series will close Wednesday afternoon with a program of interesting short clinics, all to be held at the Auditorium.

Among the interesting guests speakers already secured by the committee for the meeting is Walter Sebening of the University of Frankfurt, Frankfurt on the Main, Germany. Dr. Sebening is completing six months of research on peptic ulcer at American medical centers, a subject on which he has done important work in Germany. He will report on his findings as one of the major program features of the meeting. Carter Wood, Columbia University, will talk on some phase, yet to be decided, of the cancer problem; Theodore M. Davis, Greenville, S. C., will explain a new and simple method of prostate resection with illustrative moving pictures and discussion by notable Minnesota urologists; Willis C. Campbell of Memphis, Tenn., will speak on some phase of industrial surgery, illustrating his talk with moving pictures; Ralph Major, Kansas City, will talk on hypertension.

For the Wednesday afternoon clinic the following subjects have been tentatively selected: blood, goiter, heart, kidney, epilepsy, diabetes, neurology, dermatology, mastoids, urology, poliomyelitis, eczema, periodic health examination.

Any members possessing moving pictures of scientific or technical interest to the medical profession are especially requested by Dr. W. A. O'Brien, chairman of the Committee on Scientific Exhibits, to write him about them, giving title, size and length. The films will be used to create a continuous moving picture show on the stage of the exhibit hall during the meeting.

Women of the Hospital Association have been ex-

tended an official invitation from the Women's Auxiliary of the medical association to meet with them during their two day annual meeting scheduled for Tuesday and Wednesday, May 24 and 25. An unusual and especially attractive number of social affairs is being arranged for the augmented meetings.

FRACTURE SYMPOSIUM

The Minneapolis Surgical Society and the Regional Sub-Committee of the Committee on Fractures of the American College of Surgeons will jointly conduct a symposium on fractures on February 3 and 4.

The first meeting will be under the direction of the Fracture Committee and will be held in the auditorium of the Hennepin County Medical Society at 8 p. m., February 3. At that time the subject of fractures in general will be discussed by representatives of the hospitals and the University of Minnesota.

On Thursday, February 4, Dr. Kellogg Speed of Chicago will be the guest of the Minneapolis Surgical Society. He will give a clinic with demonstration of cases at the Minneapolis General Hospital at 10 a. m. He will speak to the medical students at 2 p. m. in the Todd Amphitheater of the University Hospital.

The annual formal meeting and banquet of the Minneapolis Surgical Society will be held at the Nicollet Hotel, February 4, 6:30 p. m. Following the banquet Dr. Speed will deliver the annual address.

All these meetings are open to all members of the profession in good standing. Reservations for the banquet must be made with the secretary, Dr. H. O. McPheeters, Atlantic 5579, before 5 p. m., February 3.

Banquet tickets \$2.00.

RICE COUNTY SOCIETY

The annual meeting of the Rice County Medical Society was held Wednesday, December 16, 1931, at 6:30 p. m., in the Main Hall at the State School for Feeble-Minded.

Dinner was served at 6:30 p. m. by Dr. and Mrs. J. M. Murdoch. The doctors' wives, local nurses and the Auxiliary were invited.

Following the dinner an entertainment was given by the children of the school. Addresses were made by Dr. J. M. Murdoch, president of the society; by Mrs. M. L. Mayland, president of the local auxiliary; and Dr. C. F. McClintic, Williamsburg, West Virginia, Professor of Neurology and Chief of the Department of Anatomy at the Detroit College of Medicine and Surgery, spoke on the subject of Headaches.

C. J. PLONSKA, *Secretary*.

RED RIVER VALLEY SOCIETY

The annual meeting of the Red River Valley Medical Society was held December 8, 1931, at the Hotel Crookston, Crookston, Minn. A banquet was served at 6:30 P. M. with guests, friends, and ladies of the auxiliary.

The scientific program consisted of the following:

1. "Presentation of Some Bone Lesions in Children."

LYLE L. BROWN, Crookston.

2. "The Management of Mastoiditis."

J. G. PARSONS, Crookston.

3. "Cancer of the Skin." Presented as a moving picture—courtesy of the Committee on Prevention of Cancer.

At the business meeting following the scientific session the following were elected as officers for the coming year: President, Dr. O. F. Mellbye, Thief River Falls; vice president, Dr. H. H. Hodgson, Crookston; secretary-treasurer, Dr. C. L. Oppegaard, Crookston; censor, Dr. H. H. Holte, Crookston; delegates, Dr. H. M. Blegen, Warren, and Dr. O. E. Locken, Crookston; alternates, Dr. O. J. Engstrand, Warren, and Dr. J. F. Norman, Crookston.

C. L. OPPEGAARD, M.D.
Secretary-Treasurer.

SCOTT COUNTY SOCIETY

The December meeting of the Scott-Carver County Medical Society was held at the Broz Hotel at New Prague, December 8, 1931. H. M. Huenekens, Minneapolis, spoke on "Abdominal Pain in Infancy and Childhood"; Walter H. Ude, Minneapolis, on "The Diagnosis of Early Pneumonias with X-ray."

At the invitation of P. M. Fischer, Shakopee, it was decided to hold the next meeting of the society at Shakopee.

Boehler's technic in reducing fractures was discussed at the November meeting of the society, also held at the Broz hotel in New Prague. R. R. Cramer of Minneapolis spoke. A. C. Strachauer, Minneapolis, showed some interesting motion pictures taken in India in the course of a recent world tour.

WASHINGTON COUNTY SOCIETY

The meeting of the Washington County Medical Society, held November 10, 1931, at Stillwater, was of outstanding significance to the society, as we are about to launch on a new enterprise. We have for some time endeavored to align ourselves with the different activities devoted to the health of pre-school and school children, by giving examinations and tests, to give the protection to which a growing generation undoubtedly is entitled. From the start we have held this to be a very worth while insurance and therefore worth at least a nominal fee. We have and do insist on a fee, no matter of what size. We feel the medical profession has been and is continually asked to do altogether too much for charity. This Society has placed itself on record as willing, at all times, to render free service where it is actually needed, and without a murmur. However, this Society is also very anxious to act as a strong retention wall to help stem this tide of charity demand that is trying to engulf us from all sides. No other class or individuals are so persistently being made the target for charity seekers, societies or other combinations that would profit or be credited with, or able to further some project of their own by charity work done by the regular medical profession. We also believe that too much charity paves, or helps pave,

the way for a very undesirable thing "STATE MEDICINE."

We have about completed arrangements for giving the Mantoux test to Junior and Senior students at our High School for a small fee. This will be our first step in the care tendered our school children as a society.

We have been slow in arriving so far, but we are slow so that we may avoid mistakes, and be able to profit by those made by others. We have sought, through our County Health Relations Committee and others, information from other sources helpful in this work. At this meeting Dr. Everett Geer, of Saint Paul, was specially invited to go over our plans with us, and Doctor Geer certainly gave us unstinted measure of his substance. As a result we now feel well prepared to go ahead with some benefit to ourselves and more so to those more chiefly concerned—the school children. In holding out for a fee for our work, we feel we are helping to fight a battle, the winning of which is of outstanding importance to every regular practitioner in the United States.

E. SYDNEY BOLEYN, M.D., *Secretary.*

WOMEN'S AUXILIARY *Minnesota State Medical Association*

President—Mrs. James Blake, Hopkins
Chairman Press and Publicity—Mrs. Glen R. Matchan,
Minneapolis
Editor—Mrs. Horatio B. Sweetser, Jr., Minneapolis
RICE COUNTY AUXILIARY

Dr. and Mrs. J. M. Murdoch entertained the Rice County Medical Society and the Medical Auxiliary at the annual dinner on the evening of December 16 at Faribault. Following the banquet an interesting program of music, dances, and a short play, was given by the children of the State School.

The meeting was then opened by Dr. J. M. Murdoch, president of the Rice County Medical Society.

Mrs. M. L. Mayland, president of the Auxiliary, told of the work the Auxiliary is doing, in the making over of clothing for the needy.

Dr. C. F. McClintic, of Williamsburg, W. Va., gave a very interesting talk on headaches.

The rooms were beautifully decorated with Christmas greens, and about one hundred guests were present.

STEARNS-BENTON MEDICAL AUXILIARY

Mrs. George Mosby was hostess to the Stearns-Benton Medical Auxiliary on December 4. At this meeting \$10 was voted to the Minnesota Public Health Association.

WASHINGTON COUNTY AUXILIARY

On January 5, at a social meeting of the Washington County Auxiliary, it was voted that the money from the benefit bridge held in the Spring, with the addition of \$9.00 already in the treasury, be used for installing a long needed drinking-fountain in the hospital.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of November 11, 1931

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, November 11, 1931. After dinner at 7 o'clock, the meeting was called to order by the President, Dr. J. S. Gilfillan, at 8 o'clock.

There were 55 members and 2 guests present.

Minutes of the October meeting were read by the Secretary and approved as read.

Dr. William Davis read, for the Necrology Committee, the following memorial to Dr. H. J. O'Brien, and a motion was carried that this be placed in the permanent record of the Academy and a copy sent to the family of Dr. O'Brien.

DR. HENRY J. O'BRIEN

1862-1931

Joining the Academy in 1906, Dr. O'Brien was one of the older men both in membership and in age, as he was in his seventieth year at the time of his death, which occurred on September 16 last after an illness of only four days.

Born in the neighboring state of Wisconsin on April 21, 1862, he was brought to Minnesota in his early childhood and, after a general education in both parochial and public schools, he entered the Medical Department of the University of Pennsylvania, from which he received the degree of M.D. in 1888, beginning at once the practice of his profession.

Most of the limited surgery of that day was in the hands of a few general practitioners, one of whom, in St. Paul, was the late Dr. Everton J. Abbott, with whom Dr. O'Brien formed an early association. From the experience and instruction gained as Dr. Abbott's assistant, he soon developed an aptitude for surgery that in later years warranted his limiting his practice to that branch.

At this day it is not easy to realize the difficulties of those who fitted themselves to become experts in surgery at the time when the development of aseptic technique was adding in rapid succession one area of the body after another to the fields for legitimate surgical operation. These men had to learn everything for themselves for there was no one to teach them. Of this growth of surgery Dr. O'Brien was a part. He was recognized as belonging to the first rank of surgeons in the locality in which he practiced.

One of his most striking characteristics was his willingness to undertake some of the almost forlorn hopes of surgery. Where operation was the only chance, no matter how slender that chance might be, he was ready to give the patient the benefit of it, regardless of injury to his own surgical reputation by the probable failure. This was a part of a generous and unselfish nature which manifested itself in innumerable instances in his private as well as in his professional life. No deserving person who appealed to him for help of any kind was ever turned away.

Dr. O'Brien was a delightful companion. To a keen sense of humor and a ready wit was added the ability to describe any happening in a most entertaining way and to make the most of its interesting features. He will be missed sadly from our gatherings.

Your committee recommends that this memoir be included in the records of the Academy and that a copy of it be sent to Dr. O'Brien's family.

(Signed) E. M. JONES,
C. C. CHATTERTON,
WM. DAVIS, Chairman.
The Committee.

The scientific program consisted of the following:

DR. EMIL S. GEIST (Minneapolis) presented two patients on whom he had operated for Tuberculosis of the Tarsus. Dr. Petter, of Glen Lake Sanatorium, by invitation, showed X-ray lantern slides of these before and after operation.

About the middle of the last century Ollier performed and described a block resection of the tarsus in the case of tuberculosis of these bones. Several years ago I did this operation with good results and have since added two more cases, in my private practice, with three additional cases which we have done at Glen Lake Sanatorium.

The cases which I wish to present show perfect results with the type of operative treatment mentioned, while each patient has a different area of the tarsus involved.

Case 1.—E. H. This little girl presented involvement of the anterior part of the os calcis and posterior part of the cuboid, at the age of three years. Under routine sanatorium care plus fixation and heliotherapy for two years, the general condition improved but bone destruction occurred between the astragalus and scaphoid. Resection through the anterior portion of the os calcis and the astragalus, and through the cuneiforms and cuboid was performed on October 16, 1929. On January 9, 1930, a brace was applied, the child having been walking in a Böehler cast for about a month. She was discharged August 12, 1930. As you see, her foot is a bit shorter than the unaffected one. She walks well and has a good functioning member, two years following resection.

Case 2.—V. M., female, aged twenty-three. This patient presented a lameness and soreness over the dorsum of the right foot for one year before definite bone pathology was demonstrable. Finally an X-ray film revealed an infectious process between the scaphoid and cuneiforms which was thought to be tuberculous in nature. On April 8, 1930, an Ollier resection was done through the neck of the astragalus and calcaneocuboid joint proximally and through the cuneiforms and the cuboid-metatarsal articulation distally. The distal segment of the foot was drawn up and fastened to the os calcis and astragalus with heavy chromic gut. Six weeks postoperative a Böehler cast with stirrup was applied and the patient was allowed to walk. The brace was applied in October and the patient was discharged.

As you can see, there is definite shortening of the foot but the function is good.

Case 3.—Mr. E. H., male, aged fifty-two. A typical Ollier resection was also done here. Healing occurred quite rapidly and the patient has now been ambulant for one year since the operation.

DISCUSSION

DR. ARNOLD SCHWYZER (St. Paul): It is a little over 30 years ago that a man came to my office with a foot that was at least twice the size of the normal one. He had tuberculosis of the tarsus. He was 18 years old at the time. We incised on the sides of the foot and scooped out the tarsal bones, leaving only a little of the shell of the bones. Of the astragalus, we removed the head and neck part, the cuboid scaphoid and cuneiform were scooped away, leaving only a partial shell. Iodoform was put in and the skin closed tight after the foot had been somewhat crushed together into a more normal form. There was fine primary healing. After about a year he came in again one day walking with crutches and with a foot swollen up as large as it had been before. I was utterly chagrined when the man came in in this bad shape. The patient, noticing this, said that the foot I had operated before was the one he was walking on now, and that the trouble was now in the other one. I operated upon this foot in the same way. Two or three years ago he brought his wife to our office for an operation and he told me he had never had any trouble with his feet for all these years.

These cases show how in tuberculosis of the foot, if the general condition allows it, you can get very gratifying results from conservative surgery in the young.

DR. MOSES BARRON (Minneapolis) read his inaugural Thesis entitled "The Importance of Hepatomegaly and Splenomegaly in Differential Diagnosis." Lantern slide charts were shown.

DISCUSSION

DR. S. MARX WHITE (Minneapolis): This paper ought not to go without some discussion because with an enormous amount of work and detail Dr. Barron has taken a great deal of dead material and made it into a living study for physicians. I don't know of any other study like it. I think it is not necessary to comment on his conclusions. He has brought out and made clear the limited character of the material. In this climate and latitude many of the diseases causing hepatic and splenic disorders are rare, consequently are not present in representative amount. Within the limitations of the material, therefore, this analysis is useful to the clinician in the terminal stages of the disorders he has analyzed.

DR. R. E. SCAMMON (Minneapolis): I wonder if, on behalf of those who are interested in the study of quantitative anatomy, I may express my appreciation of this paper. Those of us who are engaged in this kind of work have always felt the need of a study of this kind on borderline cases made by one with clinical experience.

Dr. Barron has spoken of the effect of blood content. So far as I know, the only work in this line was

done a good many years ago by Sappy, who tied off the veins and arteries of the liver immediately after death and found that the liver weights thus obtained were about 200 grams above his controls, an increase of about one-seventh or one-eighth in the weight of the organ. So far as I know, no one has determined experimentally how much blood there is in the average spleen at autopsy. Dr. Barron's work indicates that the changes in spleen weight that may be produced by pressure of neoplasms on the splenic vessels are considerable.

I was very much impressed by the effect of subacute endocarditis on the weight of the spleen. For some years, in gathering supposedly normal spleen weights in children, we watched the records carefully for references to heart disease, and threw out all spleen cases with heart disease. Apparently, from Dr. Barron's work, we were justified in this procedure. It is interesting that Dr. Barron did not get any of these extreme splenic weights in gastroenteritis. I have always questioned the work of Stricker on this subject.

I was also very much interested in the weights Dr. Barron obtained in cases of accidental death. I wonder if we must revise our concepts of the normal weights of most viscera in much the same way as we have those of the thymus. Up to a few years ago we were describing hypertrophied thymi as occurring in cases of sudden death, and it was not until Hammar's work on cases of sudden death of known cause that we discovered our concepts of the weight of this organ were really based upon cases in which hunger atrophy had occurred.

Contributions of this kind will enable us to establish an adequate metric description of the human body.

DR. C. B. WRIGHT (Minneapolis): I want to congratulate Dr. Barron on this careful paper which bears out our impressions and conforms to the literature on this subject, namely, that malignant livers become very large before death and that leukemia is the common cause of large spleens. There are, however, many conditions such as cyst and cirrhosis which do produce large livers. Rolleston reports a cirrhotic liver that weighed 7,000 grams, in an alcoholic. The conditions that Dr. Barron describes are end-results of disease. From the clinical standpoint our greatest concern is in the early recognition of conditions of this kind. The difficulties in the early recognition of enlarging livers and spleens are many, such as thick abdominal walls, ascites, muscle rigidity, etc. However, this does not detract from the interest of the paper pathologically.

DR. BARRON (in closing): I wish to thank those of you who have so kindly discussed this paper. Dr. Scammon's remarks were especially interesting and they make me feel all the more the value of the study which I am now pursuing.

In regard to the question about the spleen in goiter, it is possible that one or two cases were encountered with large spleens but because of the rarity of the condition they may have been placed under the miscellaneous group. In the study now in progress there is a special group under goiter and this will probably

bring out the variations in the size of the spleens. With reference to Dr. Wright's remarks, what I said in the beginning of my paper bears very pointedly on this subject. In the present study I have excluded all the questionable sizes and those that are just barely palpable. Most of the discussion centered on the definite hepatomegalies and splenomegalies where the livers weighed over 4,000 grams and the spleens over 600 grams. As you noticed, the organs that fell below these figures might be encountered under a large variety of conditions.

DR. A. E. WILCOX (Minneapolis) reported three cases of Acute Abdomen Complicating Pregnancy, as follows:

Abdominal operative procedures during pregnancy generally are looked upon with great misgivings and considerable concern. However, there are certain definite emergencies complicating pregnancy which demand surgical intervention. Such surgical conditions may be classified as follows:

- (a) The acute abdominal conditions.
- (b) Pathological processes which later in pregnancy may interfere with labor, such as ovarian cysts.
- (c) Pathological conditions which if allowed to progress awaiting delivery become unmanageable or threaten life, such as acute inflammatory processes.

The following three cases which are here reported come under the first class, namely, the acute abdomen. All were of extreme gravity and of a dramatic nature, requiring immediate operative treatment, and followed by as gratifying and successful results as could be expected in parallel cases occurring in the non-pregnant woman. When an "acute abdomen" develops during pregnancy a critical period is present. Loss of time in needless methods of investigation may be the deciding factor in mortality. I do not believe that too much stress should be laid upon the desirability of detailed diagnosis. The fact that an acute abdominal condition is present is sufficient. A tragedy has occurred which needs immediate and experienced attention. The general practitioner when confronted by such conditions need not feel humiliated by not carrying the diagnosis further. When surgical consultation and interference is sought, and this should be done as soon as possible, the combined conscientious effort should be to attempt to arrive at as correct a diagnosis as possible, yet under the most favorable conditions the acute abdomen will continue to remain only too frequently a mystery until the peritoneal cavity is explored.

Case 1.—Mrs. M., aged twenty-seven, seven and one-half months pregnant. About one month before admission, the patient had experienced some pain, rather severe in character, in the left lower quadrant of the abdomen. The pain was "shooting" in character and referred to the left shoulder. There was nausea, but no vomiting. Upon the day of admission she had been seized with severe pain in the lower mid-abdominal region, "cutting" in character, radiating to the left shoulder. Hypodermics of morphin failed to relieve

the pain. Her doctor viewed her condition as one of acute abdomen. Upon admission to Eitel Hospital, January 30, 1930, her temperature was 98°, pulse 72, blood pressure 118/78, respiration 18, and leukocyte count 16,800. The abdomen was enlarged, compatible with a seven and one-half months' pregnancy, there was extreme tenderness on the left side, and marked rigidity elicited by palpation. Previous history and other physical examination was negative. A provisional diagnosis of acute abdomen was made, and while obstruction of the bowel was considered, no detailed definite diagnosis was ventured.

A left rectus incision was made. No free fluid was present in the abdomen. The uterus was smooth and enlarged nearly to term. There were two small fibroids on the posterior wall of the uterus. Adnexæ were normal. The omentum and mesentery of the bowel, small and large, as well as the epiploic appendages, showed white tubercles suggesting grossly either tuberculosis or fat necrosis. In the left epigastrium a mass about the size of a large lemon was felt which subsequently appeared to be the base of a volvulus or mesenteric thickening and the mesentery at this point was edematous. The first appearance of the small bowel was that of collapsed bowel, but on further evisceration the upper portions of the jejunum were dilated and cyanosed. This was followed down to the mass above mentioned and when the mesentery was untwisted, the color immediately returned in the bowel. No other pathology was found. The wound was closed with plain catgut, reinforced with chromic, interrupted and continuous in the fascia, silkworm close together and dermal for the skin. Post-operative diagnosis was volvulus of the jejunum complicating pregnancy.

Recovery was complicated by some nausea, inability to void, and the inevitable "gas pains." However, there was no alarming rise in temperature, or irregularity of pulse and respiration. Fifteen days after the operation the patient went into labor and was delivered by forceps without laceration. The child, a six-pound girl, lived and the mother made an uneventful recovery.

Case 2.—The following case presented an acute abdominal emergency immediately following labor.

Mrs. D., aged twenty-four, whose present complaints were abdominal distention, abdominal pain, weakness, vomiting, and inability to urinate. Labor pains began Friday, March 21, about 8 p. m. The pains were not severe. The membranes had ruptured two days before. The patient says she did not pass her urine Friday night after the pains began. About 11 p. m. Friday she complained of nausea and vomited, then went back to bed and was awakened at 2:30 by sharp pains. She thinks that at 3 a. m. the pains got much worse and she says she felt as though something broke. The doctor arrived at 3:30 a. m. The baby was delivered at 4:30 a. m., weight 7 pounds, normal, no instruments used. The placenta came normally, and there was normal flow. She says she had no pain after delivery. About 8 a. m. she started to vomit. She could not even retain water. There was no blood at first. The doctor came at 2 p. m. because of abdominal distention

and continued bloody vomiting. She had not voided, but the bowels had moved. The doctor then catheterized the patient and 350 c.c. of bloody urine was obtained. The patient stated she noticed her heart pounding and distention of the abdomen was increasing rapidly.

Upon admission to the hospital the patient was slightly cyanosed, blood pressure 130/78, pulse 140, temperature 100.9°, respiration 28. Examination of the abdomen revealed fullness in the left lower lumbar region. It was difficult to make a fluid wave, there was no spasm or rigidity, and no vaginal bleeding. The patient was catheterized and 400 c.c. of dark brown reddish urine obtained and, upon pressure below the ribs and in the lumbar region, an additional 250 c.c. of the same colored urine was obtained per catheter. Microscopic examination showed blood cells and many crenated cells.

The presence of the blood in the urine obtained by a catheter, the abdominal distention, rapid pulse, and the expression of additional urine by pressure upon the abdomen suggested an injury in the genito-urinary tract and a tentative diagnosis of ruptured bladder was made.

The abdomen was opened and free bloody fluid escaped. The uterus was well contracted and free of adhesions. The bladder was drawn up and on its superior lateral surface a rent was found about two inches long. The bladder mucosa and walls were apparently normal. The bladder mucosa was repaired with plain catgut and reinforced with a layer of Duxol and several individual sutures to take off the strain. The wound was drained with two Penrose drains going down either side of the uterus. The wound was then closed with tier sutures and reinforced with silkworm. A mushroom retention catheter was inserted in the urethra. The pulse average was 167, fairly good quality, and irregular. Post-operative diagnosis was rupture of the urinary bladder.

Her convalescence, while somewhat stormy, was progressive, with complete recovery. On March 23 she developed severe herpes of the mouth, but otherwise made an uneventful recovery, leaving the hospital on the twentieth post-operative day. The patient has remained well to date.

Case 3.—Mrs. K., aged thirty-seven, mother of three normal children, and deliveries normal. She complained of pain in the abdomen, rapid enlargement of the abdomen, pregnancy, shortness of breath, and inability to lie down.

The patient thinks she is seven and one-half months pregnant and about two weeks ago she noticed very rapid increase in the size of the abdomen. During that time she had had some pain, but during the last night very severe pain started, especially on the right side. This radiated to the back and her abdomen became so tense and sore that she could not touch it, and she was unable to lie down because of the severe pain and dyspnea.

Upon admission her temperature was 98.6°, pulse 120, w.b.c. 10,000, urine negative, no nausea or vomiting, and

her bowels moved normally. There had been no urinary disturbance in her past pregnancies. The abdomen was enormously enlarged, extended from the symphysis to the costal margin with almost board-like rigidity. On touching the abdomen lightly the patient complained of severe pain. Ballottement indicated fluid present, which was encysted and under great tension. No fetal heart tones were heard. The patient states that she thought she felt movements of the baby during the last two weeks, but not as active as before that time.

Irrespective of the pain the patient has had previously, the sudden onset of the pain before admission, and the enlargement of the abdomen suggested a rapidly growing ovarian cyst and, on account of the severe pain, probably a twisted pedicle. Ruptured uterus and acute hydramnios were also considered.

The patient was given a spinal injection of 200 milligrams of novocaine. A right rectus incision was made. When the peritoneum was exposed, there was a definite blue color beneath, which indicated blood present. In cutting through the peritoneum, the peritoneal cavity was filled with blood and clots. The peritoneum was very thick. All the blood was removed. The uterus was enormously enlarged, filling the entire abdominal cavity. Inasmuch as the source of bleeding could not be discovered, as the uterus was firmly fixed within the abdomen, it was decided with the consent of the family to do a cesarean section. The uterus was rapidly opened. Its walls were extremely thick and, when opened, clear hydramniotic fluid spurted forth, having been under great pressure. It is estimated that three gallons escaped. The child was rapidly delivered, but found to be dead, a monstrosity with anencephalus and spina bifida. The placenta was delivered intact and 1 c.c. of pituitrin was given directly into the uterus by hypodermic. I was then able to pull the uterus directly forward out of the abdomen and found a rupture on the right posterior area, below the attachment of the right tube. Some of the blood vessels in this area were the size of a little finger and bleeding was profuse. The walls of the uterus were closed with three layers of suture. There was another very weak spot on the left posterior surface of the uterus and this was sutured with chromic catgut. During these manipulations, the uterus relaxed considerably and 1 c.c. of ergot was given. Some additional large blood clots were found beneath the liver and these were removed and the abdomen closed without drainage.

Post-operative diagnoses: Hemoperitoneum, cesarean section, ruptured uterus, and monstrosity.

The pathological report of the monstrosity was anencephalia, craniorachischisis, meningomyelocele, pulmonary atelectasia, prematurity, absence of spinal cord.

This mother made the most uneventful recovery of the three cases. Her highest post-operative temperature was 102.2° on the fourth day. It rapidly returned to normal and continued within normal range. The patient left the hospital on the fourteenth post-operative day and has remained well without complaint to date.

DISCUSSION

DR. A. C. STRACHAUER (Minneapolis): The diag-

nosis and treatment of the acute abdomen in pregnancy is the same as in the non-pregnant woman. The literature on the subject always emphasizes the importance of gentle manipulation at the time of operation. This is, of course, always important in the non-pregnant as well as in the pregnant patient. The most common acute condition of the abdomen complicating pregnancy is appendicitis. I personally have operated upon seven such cases. I recall two of these cases at the University Hospital, in which the appendix had ruptured, and in both cases the peritoneal infection was general. Dr. Litzenberg will recall them. Both of these recovered, as did the five cases without rupture, and without any miscarriages obtaining. We should have no hesitancy in operating upon any emergency surgical condition complicating pregnancy. Miscarriage is not likely and has not occurred in a single instance in my personal experience, which includes two cases of myomectomy, one of volvulus, and one of nephrectomy for an acute suppurative condition of the kidney. In conclusion, then, the pregnant woman should be treated the same as the non-pregnant, and miscarriage is a very unlikely occurrence.

DR. A. T. MANN (Minneapolis): I think we all have had quite a number of cases of acute abdomen in pregnant women. It is quite remarkable how well they stand operations and how rarely they miscarry.

Of the many interesting cases there is one in which the uterus formed the anterior wall of a deep abscess. This was an acute appendicitis, and with an abscess outside of the appendix. The anterior wall was the uterus and the posterior wall the sacrum. The patient was six months pregnant. I opened the abdomen and left a drain in between the uterus and the sacrum. She had a normal child later at full term. Here was a case in which there was actual infection onto the wall of the uterus itself and nothing but a drainage tube between the uterus and the upper part of the sacrum.

DR. J. C. LITZENBERG (Minneapolis): These three cases presented by a general surgeon and discussed so far by general surgeons might give you the idea that any man will operate in these cases. But as an obstetric consultant, I have been surprised at the number of men who, because of the pregnancy, hesitate to open the abdomen in such acute conditions. Wherever there is an acute surgical condition or one dangerous to the patient, the pregnancy should be ignored. Usually the pregnancy is not interrupted by the operation. I think we may approach these cases with surgical judgment and without obstetrical fear.

DR. ARNOLD SCHWYZER (St. Paul): I think these three cases are unusual cases and very pretty ones. The first case where a simple free torsion of the mesentery caused obstruction is a very unusual one, though I have seen one such case. As Dr. Strachauer says, the most frequent cause of acute abdomen in pregnancy is probably appendicitis. I remember two cases of gangrenous appendix in pregnancy. Labor started and they both died. Thus I greatly fear the combination of pregnancy with acute appendicitis.

Dr. Wilcox's second case, rupture of the bladder in an otherwise normal labor case, is most unusual as it seems there had not yet been much labor pain, if I understood him rightly. I wonder if there was some peculiar weakness in the bladder wall. I have seen one case of rupture of the urinary bladder where 6,000 c.c. of urine were taken away from the bladder; but that was in a case of retroflexed pregnant uterus. That woman came to the hospital with peritonitis from perforation of the bladder due to distention ulcers. She died.

Dr. Wilcox's third case, rupture of the uterus, of course occurs, but here was a non-ruptured hydramnios and, if I understood the case correctly, there was apparently no severe labor pain.

I think, outside of acute appendicitis, the thing which is of comparatively most frequent occurrence is an ovarian tumor with twisted pedicle. When the uterus rapidly descends into the pelvis after delivery, the ovarian tumor follows and sometimes becomes rotated. I have seen this condition, and we have diagnosed it beforehand.

DR. WILCOX (in closing): In Case 2, the history showed that this woman did not remember passing urine during the evening prior to delivery. She stated that about one and one-half hours before delivery her pain became very severe and she felt that "something broke," then the pain was much relieved. The probable and most plausible explanation of the injury to the bladder, in the absence of pathology therein, is that excessive pressure on a distended bladder during labor caused the laceration described.

DR. F. F. CALLAHAN (Pokegama) reported the following case of Tuberculosis of the Trachea, and showed specimen removed at autopsy.

Mrs. H. B., married, aged thirty-one, was admitted to Pokegama Sanatorium on August 31, 1931. Her occupation had been that of housewife for the past three years, and she had been a linotype operator for seven years previous to her marriage. She worked in an office with a boy who later developed tuberculosis and died. The family history is negative. She had measles and mumps in childhood, typhoid fever at 21 years of age, and tonsillectomy under local two years ago.

The first symptoms of her present illness were cough and loss of weight which began in the fall of 1929. She consulted a physician in the spring of 1930 who thought the cough was due to heart disease. A diagnosis of tuberculosis was made in April, 1930. She spent two months in bed in New Mexico, returning to Minnesota by car and has been in bed ever since. She has been short of breath for nearly a year and has had acute attacks of dyspnea since May, 1931. She developed bilateral cervical adenitis in the spring of 1931.

Physical examination showed evidence of parenchymal infiltration in the right side with a chronic pleurisy and probably a small effusion on the left side. The sputum was positive for tubercle bacilli. The

blood examination was negative except for a low hemoglobin, 51 per cent (Sahli). The urine showed pus cells at two examinations. The Wassermann was negative at two examinations.

Her temperature ran from 100° to 102° most of the time; pulse 100 to 112. The patient always had difficulty in raising sputum and felt as if there was something in her trachea that she could not get out. A bronchoscopic examination was performed on September 17, 1931. This showed a shaggy exudate lining the entire trachea and extending into the main bronchi. Some of this exudate was removed and microscopic examination showed tubercle bacilli. The patient felt better for two weeks after the bronchoscopy and then began to have very severe attacks of coughing and dyspnea. She was considered too ill to be bronchoscoped again and on October 11 a tracheotomy was done by Dr. Gardiner. The patient died during the operation.

Permission was obtained for a partial postmortem, which was done after the body had been embalmed. The left pleural cavity was adherent over the base and there were many small adhesions over the remainder of the left lung. There were a few pleural adhesions on the right side. The heart and pericardial sac were negative. The abdominal cavity was negative. There was a small ovarian cyst on the left side. The right lung showed many areas of caseo-fibrous tuberculosis. The left lung showed very few parenchymal tubercles. The lung was small and covered with a thick pleura. The entire trachea and large bronchi in the right lung were lined with an organized exudate. The tracheal rings seemed to be greatly weakened and the trachea was easily compressed. The exudate extended about 2 mm. past the bifurcation into the left main bronchus. The remainder of the left bronchial tree was negative. There were two slightly enlarged lymph nodes in the hilum.

The report on the microscopic sections of the trachea was tuberculosis involving the wall of the trachea including the cartilaginous rings.

The meeting adjourned.

R. T. LA VAKE, M.D., Secretary.

OVALTINE NOT ACCEPTABLE

The Committee on Foods reports that Ovaltine is a chocolate flavored dry malt extract, containing a small quantity of dried milk and egg which is sold with two slogans: "A food beverage" and "A food concentrate." From its examination of the product, the Committee concludes that Ovaltine is essentially a carbohydrate food, and that its value in gaining weight is no more nor less than that of other similar carbohydrate mixtures, and that Ovaltine is sold with grossly exaggerated claims; its composition is kept a mystery, and that even if it did contain what the manufacturer says it does, it could not do the things the manufacturer says it will. The Committee has listed Ovaltine with the products not acceptable. (Jour. A. M. A., December 12, 1931. p. 1798.)

PROCEEDINGS OF THE MINNEAPOLIS SURGICAL SOCIETY

Meeting of December 3, 1931

The regular monthly meeting of the Minneapolis Surgical Society was held in the lounge on the 20th floor of the Medical Arts Building, on Thursday evening, December 3, 1931, at 8 o'clock.

The meeting was called to order by the Vice-President, Dr. E. K. Green, in the absence of the President. There were twenty-five members and five visitors present.

The following scientific program was presented.

DR. VERNE S. CABOT reported "Two Unusual Cases of Carcinoma of the Colon." The patients were presented.

The two cases to be briefly described and shown here are of interest because of their age variance, the pre-operative signs and symptoms, the favorable location of their tumor growths, as well as the choice of surgery employed.

Case 1.—The first case is a man forty years of age, an office worker, whose history shows nothing of importance until November, 1928, when he first began to notice abdominal distress, which was mild, cramp-like in character with maximum intensity in the right lower quadrant. These attacks were mild and infrequent in occurrence until April, 1929, when he had four distinct attacks, still mild in type, and unattended with gastroenteric disturbances sufficient to force him to call medical aid. The following month the attacks of abdominal distress became more persistent, associated with mild colic, most accentuated in the right lower quadrant and radiating to the epigastrium. The taking of food would often initiate the colic, at which time he would be somewhat nauseated, but there was no vomiting. He also noticed a tendency towards bowel looseness, even to watery stools, frequent in occurrence but small in amount. There was no history of melena.

He was first seen at this time, and while being subjected to gastro-intestinal examinations was seized by another similar attack, which sent him to the hospital with a tentative pre-operative diagnosis of acute appendicitis. There was no distention or evidence of reverse peristalsis. There was a slight leukocytosis. Beyond this, the blood and urine showed normal readings.

At operation, through a right paramedian incision an exploration of the abdomen revealed an annular mass at the junction of the middle and distal third of the transverse colon, to the left of the mid-colic vessels. The bowel at this point was not fixed, there were small glandular masses immediately adjacent to the tumor but none was visualized or palpated in the liver; only contiguous portions of the omentum were adherent. There was no distention of the proximal bowel. Approximately six inches of the transverse colon with the immediate gland-bearing portion of the mesentery and adjacent omentum were resected, followed by an end-to-end anastomosis, the suture line being brought up to

the wound margin and covered by the remaining portion of the omentum, through which a Penrose drain was carried to the line of union.

His postoperative convalescence was quiet, the Penrose drain being removed on the fifth day. The sixth day there was a definite fecal discharge from the drainage tract left by the Penrose drain, which had been shortened daily and was out on the fifth day. The fistulous tract healed rapidly, being closed by the fifteenth postoperative day, and a week later he was discharged from the hospital. The removed segment of bowel showed an early annular carcinoma without marked ulceration or obstruction. He has worked continuously to date. Gastrointestinal studies as late as October, 1931, showed no narrowing or other abnormalities.

Case 2.—The second case is a woman past her 77th year, who, in December, 1928, first noticed increasing constipation which at that time was attributed to dietary factors and lack of exercise, partly due to advanced age and an arterial hypertension which averaged 200/100.

Her costiveness had gradually increased though enemata gave relief until May, 1929, when she was hospitalized for her increasing obstipation. For two weeks prior to her entry to the hospital she had complained of spasmodic cramp-like pain located at and below the umbilicus, intensified after meals and relieved by colon flushings. Gastrointestinal examinations revealed a partial obstruction in the lower portion of the descending colon and a tentative diagnosis was made of carcinoma with partial obstruction. There had been no history of melena or hematemesis. There were no demonstrable metastases.

This elderly lady was wholly in possession of her mental faculties and when advised of the findings at first refused to consider a colostomy. However, through a left paramedian incision an exploration of the abdomen revealed a small carcinomatous growth annular in type involving the lower descending colon at its juncture to the upper sigmoid. There were no visible or palpable metastases. There was no abnormal fixation of the mass. Glands immediately adjacent to the bowel at the tumor site were enlarged. There was no marked distention of the proximal colon.

In view of her age, general condition and the operative findings, a one-stage procedure was adopted, in which the carcinomatous area with adjacent glands with a portion of mesocolon was resected. An end-to-end anastomosis was done, the union being brought up to the wound margin and partially walled off by omentum. A single Penrose drain was placed at the line of suture. Her post-operative convalescence was entirely uneventful. There was no subsequent vomiting or rectal bleeding. The drain was out by the fifth postoperative day. The healing of the wound was by first intention. She was discharged from the hospital on the 18th day following her operation. The resected portion of colon showed a small circular carcinoma with only moderate narrowing. There was but little evidence of ulceration. To date there has been no further complaint referable to the gastrointestinal tract. Subsequent X-ray studies,

the last of which was in October, 1931, show only a slight narrowing at the site of resection.

These cases are interesting because of the early date of their recognition and resection, especially so since most often severe and prolonged obstruction with its concomitant sequelae precedes surgical intervention. The indications for a one-stage procedure, with or without proximal decompression, seldom present; however, in those cases seen early where the tumor is favorably located and in which obstruction is not the predominant factor, it may be of value in selected cases.

DISCUSSION

DR. F. A. OLSON said he would like to ask Dr. Cabot how he did this end-to-end anastomosis?

DR. CABOT replied that one was done with cautery and the other with the knife.

DR. E. A. REGNIER asked which one had the fistula.

DR. CABOT replied that the one done with cautery had the fistula. One would think it would be just the other way, but not in this case.

DR. REGNIER thought that the great part of Dr. Cabot's cases was the fact that he was able to do one-stage resections without complications. He stated that there were arguments for and against one-stage procedures: (a) frequently the size of the tumor; (b) amount of inflammation about it; (c) the degree of infection and varying degrees of obstruction make a two-stage procedure more favorable. He asked Dr. Cabot whether in his opinion this type of resection gave his patients as good a prognosis as is possible by a two-stage procedure.

DR. CABOT replied that this is a debatable question. The one-stage of course has to be in the non-obstructive type. There are less lymphatics in these two areas. Neither of these patients was infected, they were practically non-obstructive and there was no fixation. As far as elevating the mortality risk, he was of the opinion that the one-stage procedure did not do so in either of these cases. The woman was well along in years and had a high blood pressure, and to submit her to two operative procedures he felt would be more of a risk than one operation. Both of these patients lent themselves very well to the one-stage operation. Possibly in the case of the man the risk might have been increased a little by doing the one-stage operation. Dr. Cabot felt that all in all it was preferable in these two cases. Certainly the hospitalization time was shorter, but of course he realized that is not the primary consideration. He mentioned that according to the literature they are doing the one-stage operation in England more and more. And in suitable cases he felt it was a good thing.

DR. REGNIER asked how wide a resection was done.

DR. CABOT replied about six inches.

DR. REGNIER asked if the same amount of mesentery was used.

DR. CABOT stated that it was cut down to a V. In the grandmother there was a question of malignancy in a gland of the adjacent mesocolon, but in the man there was none.

DR. E. A. REGNIER reported a case of "Carcinoma of a Transverse Colon with Secondary Perforation into the Ileum."

The patient, white, female, aged twenty-four, was admitted to the Minneapolis General Hospital on June 26, 1931.

She complained of bloody diarrhea of two weeks' duration; abdominal cramps and nausea of two weeks' duration; and gradual enlargement of an abdominal mass of four months' duration.

Four months previous to the present admission to the hospital, the patient had been delivered of a normal female child at Minneapolis General Hospital. There were no obstetrical complications. Shortly after returning home following the delivery the patient had noticed a small mass to the right of the umbilicus. This mass had grown slightly during the past four months, was freely movable and not tender. Two weeks previous to admission she noticed the beginning of a severe diarrhea. Bowel movements were accompanied by severe abdominal cramps. There was nausea but no vomiting. Four days previous to admission she noticed dark red blood in the stools, and she became very weak. She states that she felt feverish. She had lost about twenty pounds in weight.

The past history and family history were entirely negative. She was married at nineteen years of age. Her husband is living and well. She had had three pregnancies, all normal.

The patient was a well-developed but poorly-nourished, young white woman, and appeared very languid and very pale. The physical examination was entirely negative except for the abdominal findings and the pallor of the mucous membranes. Her blood pressure was 110/80. There was a slight tenderness throughout the abdomen. There was a mass the size of a man's first, firm, freely movable, moderately tender, just to the right of and slightly below the umbilicus.

The Wassermann test was negative. The urine was negative. Her hemoglobin was 42 per cent, r.b.c. 3,000,000, w.b.c. 7,000, p.m.n. 57 per cent, lymphos. 43 per cent. Temperature 100°. The stools were negative for amebæ and parasites, but showed 4 plus blood. The barium studies showed obstruction in the mid-transverse colon with two enterocolic fistulas at the site of obstruction. (A series of X-ray plates were shown.)

The diagnosis was probable malignancy of the transverse colon with perforations into the ileum.

The patient was given a blood transfusion, subcutaneous fluids and high carbohydrate diet of low residue, and on the 14th day of July, 1931, subjected to operation under ether anesthesia. Carcinoma of the transverse colon with two perforations into two separate loops of the ileum was found. The entire mass was adherent to the stomach wall. There were mesenteric nodes which were enlarged. A double loop of ileum was resected about 18 inches in length and end-to-end anastomosis was done to reconstruct the ileum. The mass was freed from the stomach by resecting about three inches of the outer coats of the stomach in the

distal portion of the greater curvature. The entire mass was then brought out of the abdomen as in the classical Mikulicz procedure. The patient was transfused following the operation. Forty-eight hours later the tumor mass was resected by cautery, removing about nine inches of transverse colon. A Mikulicz clamp was then inserted in two loops of colon to re-establish the continuity of the bowel. The patient was discharged from the hospital on the 8th day of August.

At the time of this writing the patient is entirely well, has gained 25 pounds in weight, and the wound is entirely healed. Her hemoglobin is 75 per cent.

The pathological report on the tumor was adenocarcinoma of the transverse colon.

Dr. Regnier stated that his purpose in bringing this case to the attention of the Society was to stress the advisability of doing radical surgery in these apparently hopeless cases when there is at least an even chance of prolonging life in comfort. Obviously this seemed like a very radical procedure in the face of great odds, but it was also obvious that this patient could not have lived a month longer without surgical interference. He believed that a two-stage operation was the method of choice in this case. He felt that the ultimate prognosis was not good but the patient has been so well since the operation that he thought the procedure was entirely justified. He believed a great many cases of carcinoma which seem inoperable at the outset can be greatly benefited and in some cases cured by this method of treatment, especially when it is the only means at hand of offering a patient any relief whatever.

DISCUSSION

DR. F. A. OLSON asked Dr. Regnier and Dr. Cabot if they had used the inoculations as recommended by Dr. Bagen.

DR. REGNIER replied he had not used any inoculations. There had been a great deal of difficulty in isolating organisms and there was no conclusive proof that these inoculations were specific. He stated that his own case had been thoroughly vaccinated during the previous three months through the two perforations between the colon and the ileum.

DR. H. O. MCPHEETERS briefly discussed the injection treatment of varicose veins with special reference to some special work he had done along that line. He stated this particular work was undertaken with three points in mind: (1) to prove the moot question of the reverse flow of blood in varicose veins; (2) that the best results obtained in the treatment of varicose veins are obtained by utilizing the value of this reverse flow; and (3) that many recurrences following the injection treatment are not real recurrences but only incompletely treated cases.

He based this work on the assumption that the direction of flow of blood in the varicose veins could be accurately determined by the blood pressure readings taken at different points along the vein. With that idea in mind, coincident readings were taken with manometers attached to 12-gauge veterinary needles inserted into varicose loops along the vein. One needle

was inserted in the calf, one internal to the knee, one in the mid-thigh, and one into the deep femoral vein just under Poupart's ligament. The readings were then taken with the patient lying prone and erect. The change of posture was brought about by having the patient on a tilting X-ray table.

The results of the blood pressure readings clearly showed that the direction of flow in a fully-developed case of varicose veins was from the sapheno-femoral opening downward to the calf. This work will be reported in full in an early issue of *Surgery, Gynecology and Obstetrics*.

Dr. McPheeters then showed several slides of varicose veins that had been injected with skiodan. These showed the ramifications of the veins and the connection with the deep system. It also visually confirmed the reverse flow as proven by the blood pressure work. The skiodan slides further proved that the injected solution could be localized almost perfectly by means of the tourniquets and the posture of the injected limb.

DISCUSSION

DR. REGNIER asked if he understood Dr. McPheeters to say that one needle was put directly into the deep femoral vein.

DR. MCPHEETERS replied that he was exactly right. He said that for about one inch below Poupart's ligament the femoral vein lies internal to the femoral artery and that in this area the needle could be accurately introduced directly into the femoral vein. He also stated that the blood pressure readings had been taken in eight cases thus far.

DR. DANIEL A. MACDONALD read his inaugural thesis entitled "Double Uterus and Vagina with Unilateral Atresia." (Paper to be published in full in *MINNESOTA MEDICINE*.)

ABSTRACT

The paper gives a brief résumé of the surgical problem of congenital malformations of the uterus and vagina. Under embryology, the union of the two Müllerian ducts, the formation of the wall of the utero-vaginal canal and the development of the musculature of the uterus are reviewed.

The classification of double uterus includes uterus bicornis bicollis, uterus bicornis unicollis, uterus septus, uterus subseptus, and uterus didelphys.

The obstetric complications of double uterus considered are: dystocia, rupture of the mesial wall of the uterus, and postpartum hemorrhage.

Due to the wide variation of conditions met with, each case is a law unto itself and no set rules can be formulated as to treatment. Mention is made of uteruloplasty, unilateral hysterectomy, simple sterilization, and bilateral hysterectomy, as indicated in certain cases.

Dr. MacDonald reported a case of uterus didelphys and double vagina with unilateral hematocolpos and hematometra.

DISCUSSION

DR. JALMAR SIMONS of Minneapolis had been invited to open the discussion of Dr. MacDonald's thesis.

DR. SIMONS said he appreciated very much the invita-

tion to discuss Dr. MacDonald's paper, which was very interestingly and ably presented. The slides he has shown give an idea of the great number of defects that can result from improper fusion of the Müllerian ducts and the wonder is that here, and elsewhere in the human body where fusion is a vital embryological phenomenon, so few defects occur. Thirty-seven types of genital deformities have been described; the uterine deformities, in order of their frequency, are: (1) uterus bicornis, (2) bicornis unicollis (single cervix), (3) uterus didelphys; the vagina showing frequently partial or complete septums, unilateral or complete atresias. The incidence, according to the most reliable statistics, is one defect in 1,500 gynecologic cases. The records at the Minneapolis General Hospital show one in approximately 1,200 cases as follows: uterus didelphys discovered during an operation for appendicitis; bicornate uterus during an operation for ovarian cyst; complete absence of uterus in a tuberculous patient, there being only a plaque of tissue where the uterus ought to be; two cases of pregnancy in a rudimentary horn, both diagnosed as ectopic.

Vaginal and cervical malformations are diagnosed with ease, but uterine deformities, in the absence of vaginal and cervical malformations as a lead, are often misdiagnosed as uterine tumor and pelvic cysts, and the rudimentary horn pregnancy as ectopic. As shown by one of Dr. MacDonald's slides, the latter may be quite advanced principally because syncytial erosion sufficient to produce significant symptoms of intraperitoneal hemorrhage does not occur until the pregnancy is farther advanced than in ectopic. The mass itself is apt to be considerably larger than an ectopic, and one should be suspicious if vaginal or cervical deformities are present and if contractions occur in the mass.

Deformed uteri are prone to adnexal inflammation and to cause hematocolpos, hematometria and hematosalpinx if there is vaginal atresia, as in Dr. MacDonald's case.

Pregnancy occurs in the presence of genital malformations, according to some reports, about once in 1,500 consecutive cases. There is no depreciation in fertility; abortion is much more frequent; malpositions are more common; accidents of labor are likely, such as abruptio placentæ, retained placenta, rupture of the uterus, and postpartum hemorrhage. Operative deliveries are five times more frequent; morbidity eight times and mortality for the mother four times as great, with a fetal mortality five times the normal. Here, then, pregnancy is a foreboding condition.

Dr. MacDonald's case of uterus didelphys with double vagina and unilateral atresia was sure to develop symptoms as soon as she began to menstruate and increasingly ominous symptoms which each menstruation. Her symptoms were typical but the physical signs were not adequate for a definite diagnosis before operation.

Dr. Simons felt that the treatment of Dr. MacDonald's case was admirable and he thought the doctor showed considerable ingenuity in treating the blind vaginal pouch as he had. Having excised the uterus with as much of the atresic vagina as possible, he

packed the remainder with gauze with the idea that this would produce an adhesive inflammation and, when pulled out through an incision below, the pouch would soon obliterate itself, leaving, as he stated, a small depression to the left of the normal vagina. The opposite uterus was smaller and attached to the right pelvic wall by a very short broad ligament. Pregnancy in this uterus would become a serious affair, so he chose to remove it. Tubal ligation might have been done, leaving the menstrual function for psychic effect. Her amenorrhea, if properly explained, would most likely be accepted with the feeling of a burden eliminated.

DR. WILLARD PETERSON said he would like to ask a hypothetical question. If a girl should come to her doctor for an abdominal condition such as appendicitis and at operation one of these uterine abnormalities was found, what would the surgeon be justified in doing?

DR. OTTO YOERG stated that this was a very interesting paper. It reminded him of a case he had seen in his internship days, of a woman who came in to be delivered. The physician was not aware of the fact that the woman had a double uterus. One vagina was about normal in size and the other admitted a finger. Delivery and convalescence were normal.

DR. REGNIER asked about removing the blood cyst from above without opening from below.

DR. MACDONALD stated that the idea of opening below was for drainage and to remove the gauze.

He also added that the literature for the most part deals with the obstetric complications. He recalled one case reported where a diagnosis of ectopic was made and upon opening the abdomen it was found to be a pregnancy in the right horn of a bicornate uterus. The appendix was removed and the abdomen closed. The patient aborted nine days later. She later became pregnant and was brought in at term bleeding. X-ray showed the fetal head in one horn and buttocks in the other. A low flap cesarean section was done. The patient had a stormy course and one week postoperative had a very severe postpartum hemorrhage. Transfusion saved her life but the gynecologist felt that after such a harrowing experience and reading the reports of others, he questioned if one was justified in leaving in the pelvis such a malformed uterus to endanger the woman's life with a future pregnancy. Still another man, who advocates conservatism, had removed the right tube and horn of a bicornate uterus. The patient became pregnant and was brought in near term in a moribund condition. A postmortem was not obtained. Under the circumstances the doctor regretted that he had not removed the left tube also at the time of operation.

In cases of uterus didelphys the right uterus is usually the lesser developed, as is also the right horn of a bicornate uterus.

As far as the frequency of malformations of the genital tract is concerned, Dr. MacDonald stated that, excluding minor defects, Von Winkel in 600 autopsies on females found 2 per cent to have malformations of the sexual organs. Norman F. Miller of Ann Arbor (Amer. Jour. Obs. & Gyn., 1922) collected 54 cases of

true uterus didelphys from the literature in addition to one case from the University of Michigan. In the 54 cases there were 34 married women, 31 of whom became pregnant (91.1 per cent). One of the single women became pregnant also and in all there were 67 pregnancies for the 32 women. Normal birth at term occurred in 28 of the 67 pregnancies (41.7 per cent) though a great many of these labors were undoubtedly prolonged and tedious; 19 of the 67 aborted in the early months (28.3 per cent). He also cites Bayard as reporting 14 abortions in 14 cases (100 per cent).

While abortions in general occur in 24 per cent of pregnancies, Miller calls attention to the fact that 32 per cent of abortions are self-induced, and in not one of the cases in the 32 women with uterus didelphys was there a history of self-induced abortion. Forty per cent had complicated labors at term. The most frequent complication in the abnormal deliveries at term was due to the enlarged non-gravid uterus obstructing (23 per cent). Dr. MacDonald stated that the non-gravid uterus enlarges with the gravid uterus during pregnancy to about the size of a small grapefruit.

In the 67 pregnancies reported by Miller, manual removal of the placenta was necessary in 8 (11.9 per cent). In the 54 cases, 42 were associated with double vagina.

DR. S. H. BAXTER asked about sterilizing the patient and leaving the rest of the surgical procedures.

DR. MACDONALD replied that he would consider simple sterilization the ideal treatment in a great many cases. In his own case, however, the round ligament was so short that the right uterus would be lying next to the pelvic wall with a danger of torsion. He also felt that the right vagina should be supported medially in the pelvis. This girl had a pelvis 1 to 2 cm. wider than the adult female pelvis. This, with short round ligaments, was a probable factor as far as the cause of the malformation.

If one is going to treat these cases conservatively, and feels that hematosalpinx does not exist, an incision (wide) in the intervaginal septum can be made. Do not irrigate or introduce any drainage material. Do not make a bimanual examination. Place the patient in Fowler's position and watch carefully for the first symptoms of peritoneal infection. If they occur, immediate laparotomy will probably reveal a ruptured tube. The retention cases reported by Miller were diagnosed on an average of two and one-half years after the beginning of menstruation. The danger of dilatation of the upper genital tract must be remembered.

DR. SIMONS said that the incidence of flat pelvis in these cases further complicates the pregnant state. He reported a case of a girl 13 years of age who came to the hospital with very acute pain in the lower abdomen and a history of two similar attacks of less severity. There was no vagina but she had a hematometra of the size of a 3-months' pregnancy. At the introitus a line of cleavage was found which dissected up to this mass; the mass was then punctured, liberating first tarry, then brown, then red blood. A tube was sewed in for drainage and to establish a permanent canal. Two years later, examination showed a somewhat

atresic vagina, and a history of normal menstruations was obtained.

DR. MACDONALD said that in 32 cases of retention reported by Wells (Amer. J. Obst., 1900) there were 11 deaths. Of these 11 deaths, 9 occurred from septic peritonitis after puncture of the sac from below. He added that though the mortality undoubtedly is much lower today with the same procedure, there are recorded deaths even where laparotomy has been performed with the first symptoms of peritoneal infection.

There was no special business to come before the Society at this meeting, and upon motion the meeting adjourned.

H. O. MCPHEETERS, M.D., *Secretary*.

OYSTERS—A PLEASANT TYPE OF THERAPY

The announcement three years ago that copper is effective in supplementing iron in the cure of anemia produced by an exclusive milk diet in the rat promptly aroused interest. The inferences drawn by others than the investigators themselves has led to confusion and mistaken advice. There has been no warrant whatever in applying the observations without reservation to some of the unusual conditions of the blood, such as pernicious anemia in man. At the moment there is some debate whether copper stands alone in the capacity to promote the function of the iron in hemoglobin and blood cell formation. Other elements, such as manganese and germanium, are clamoring for equal recognition. Meanwhile all sorts of new products containing both iron and copper are foisted not only on the ignorant public but also on an uncertain medical profession. The chief objection to such unproved therapy is the sense of false security which leads to the neglect of other modes of therapy that may be far more effective. Recent investigations have shown oysters to be capable of curing the nutritional anemia of milk-fed rats. The studies indicate that the inorganic elements present in the oyster are responsible for its hemoglobin regenerating capacity and that the antianemic potency of the oyster can be accounted for on the basis of its content of the three elements iron, copper and manganese. (Jour. A. M. A., December 26, 1931, p. 1970.)

Berkeley George Andrew Moynihan, Baron Moynihan of Leeds, president of the Royal College of Surgeons, had a look at Sculptor Jacob Epstein's *Genesis*, grotesque figure of primitive pregnancy. Wrote he to his newspaper: "I regret to say that, in my opinion, Epstein is almost certainly guilty of an error in diagnosis. The lady, I think, is not pregnant. . . . The abdominal tumor in position and in salience is not that of pregnancy. . . . The mammary condition is that of an adipose virgin and not of a primiparous woman whose delivery is drawing near. . . . On the available evidence . . . I believe that the hopes of her admirers will be disappointed, and that no new birth is about to reward her for her obvious suffering. I can almost fancy that her expression indicates that she herself is beginning to realize this."—*Time*, Dec. 14, 1931.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

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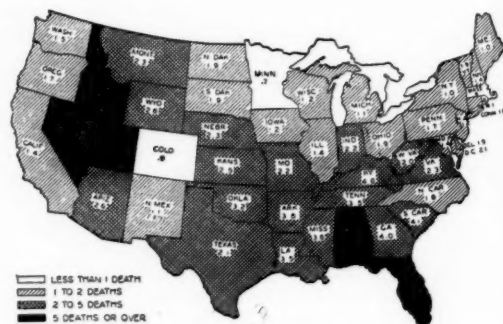
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MEDICINE

TUBERCULOSIS ABSTRACTS*

It is estimated that there are in the United States about 828,000 cases of active pulmonary tuberculosis. The total number of hospital and sanatorium beds now occupied by tuberculosis patients is about 80,000, leaving a remainder of 748,000 patients who are either receiving treatment at home or none at all. Perhaps most of those who take the cure at home do so because they are not persuaded of the advantages of the sanatorium. Others cannot enter institutions even though they would, because of inadequate local provisions. A considerable number pursue the cure at home

on the advice or at least with the tacit consent of the physician. Paul H. Ringer at the eighty-second annual session of the American Medical Association discussed the question of home treatment versus institutional treatment of pulmonary tuberculosis. Abstracts of his paper follow.



Number of beds for tuberculosis cases compared with number of deaths from tuberculosis—1928. (Exclusive of federal and penal institutions and hospitals for the insane.)

HOME TREATMENT VERSUS INSTITUTIONAL TREATMENT

The uniform success achieved by sanatoria in all parts of the country has led to the belief that climate counts for nothing and that, therefore, the cure may be carried out just as well at home. But this attitude overlooks the prime object of the institution; namely, the education of the patient. Moreover, in the sanatorium, rest is found for the mind as well as the body, for there are no responsibilities and a patient is surrounded by a sympathetic environment.

In only a minority of cases will home treatment work. Taking the cure is like finding "a way of life" and that way is particularly hard for the patient to follow at home. If there is nothing more to the treatment than bed rest, reasons the patient, he might better be at home. If he has a good home, that might be true but the point he overlooks is that, in addition to bed rest, there are details one learns from physicians, nurses, and other patients, the force of example, and the common routine. A period of quiet and of relative isolation helps the patient to regain his composure, after having been upset by the news that he has tuberculosis. He makes his adjustment to the necessary and tedious inactivity in the company of others who are trekking along the same trail.

In an institution, the regimen is so planned as to make it easy to do the right thing. The patient must deliberately step out of line in order to do the wrong thing. At home, the patient is forced to swim against the tide, for relatives and friends have scant realization of the limitations that must be placed on the patient.

The patient at home may obtain bodily rest, but relaxation, that is, freedom from mental strain, is difficult to secure. He is subject to disturbance by (1) the family, (2) friends, and (3) business. Family irrita-

*Reprinted from *Tuberculosis Abstracts*, a review for physicians issued monthly by The National Tuberculosis Association, Volume IV, Number 12, December, 1931.

tion, not rare in health, is aggravated in time of sickness. Overanxiety of relatives, a deleterious influence even in an illness of short duration, becomes a factor of major seriousness when exerted over a period of many months. The normal chatter and noise of young children render the patient's nervous system taut. At the same time, the desire for expressed affection leads to many contacts and repeated exposure of the child to tubercle bacilli. All of the minor ailments and petty misunderstandings of the household impinge themselves on the consciousness of the patient, even in an affluent home, and more so in one of poor circumstances.

The control of visiting friends is almost impossible. Strict visiting hours cannot be maintained. If there is a nurse, she is likely to be off duty during several hours in the afternoon, which is the time when friends commonly call. The disturbing gossip retailed by visitors who stay on and on leaves the patient fretful or worn out. Unsolicited advice about food and rest and "harmless" diversions, such as going to the movies or taking an auto ride, undermine the patient's morale.

Business associates are a disturbing element. Matters come up which by discussion in person or over the phone "take only a minute" to settle but leave hours of disquiet and worry. Business friends drop in when it is convenient to them and talk shop, which leaves the sick man unsettled in his mind and rebellious at the fact that he cannot take an active part. These difficulties, in principle, apply with equal force to women patients.

Most patients do best at an institution some distance away from home, say 200 miles. Visits of relatives are more difficult and telephone conversations less frequent. A factor to be considered is the enthusiasm, anticipation, or hope engendered by going away to a favorable environment; this the patient cannot possibly have if he simply goes to bed amid familiar surroundings.

THE DOCTOR SHOWS THE WAY

The determination to get well is essential. We physicians can only point out to the patient "the way of life"; mark the highway, warn against side roads, steer clear of impassable byways. We cannot carry the patient one yard, save in those cases in which lung surgery can be employed.

The author does not advocate sending the patient away from home immediately subsequent to a diagnosis of tuberculosis. Patients with tuberculous bronchopneumonia and patients who have had hemoptysis with subsequent areas of softening, accompanied by high fever and evidences of acute illness, are much better kept at home until the initial acuteness of the condition has subsided and they can be moved with relative safety. Nor should patients be "railroaded" out of their homes without being given time to take in the situation or to adjust themselves to what appears to be a cataclysmic upheaval in their lives.

The author feels that the great benefits to be obtained from leaving home and preferably from institutional treatment are as much psychic as physical;

but in the case of tuberculosis, the psychic and the physical are so intimately blended that it is next to impossible to evaluate one above the other.

DISCUSSION

Dr. James Alexander Miller: The proper regulation of rest and exercise by which each patient gradually learns his individual limitations is the most essential element in the system of cure. As with many other forms of education, this knowledge comes only by long, persistent effort. Schools are more effective than home study or correspondence courses. A sanatorium is a school for health. The patient learns unconsciously from the example and experience of his associates. He need not learn entirely from his own mistakes, which are often costly. Gradually, the knowledge of his limitations leads him to a habit of life which is instinctive and consequently no longer irksome. The skilled guidance of a trained physician, experienced in the care of chronic diseases, thoughtful of varying temperaments, capable of giving inspirational guidance, always patient and persistent, helps the patient to acquire not only a habit but a philosophy of life which enriches his life.

Dr. A. M. Forster: I was interested in what Dr. Ringer said about the difficulties of home treatment as compared in men and in women. I use an illustration in talking to the woman who wants to go back to her children. I tell her that if we took her husband and put him in his office on a cot and told him that all he needed was rest, and that he need pay no attention to the bookkeeper or to the customers or to his partners or to the telephone, and would simply get himself into the proper psychologic state and would rest, then that situation would be comparable to what the woman has to submit to when she attempts to take a rest cure in her own home.

Dr. James M. Anders: Treatment in a sanatorium some distance from home is more nearly ideal, although to remove the patient a long distance has certain disadvantages. The force of example as an aid to the patient has been under-estimated. In general, a stay of from nine months to a year is required to teach the patient the institutional regimen. When he has mastered that and if he possesses average intelligence, the treatment may continue at home.—*Pulmonary Tuberculosis—Home Treatment versus Institutional Treatment, Paul H. Ringer, Jour. of the A. M. A., August 8, 1931.*

A STUDY OF THE FIVE-HOUR DEXTROSE TOLERANCE CURVE IN TREATED DIABETIC PATIENTS: Elaine P. Ralli, M.D., and James Shannon, M.D. (Amer. Jour. of Med. Sci., September, 1931). This is a study of the effects of the glucose tolerance test on a number of treated cases. The cases were first classified clinically as mild, moderately severe, and severe, and then the results from the glucose tolerance test were compared with the classifications previously made. In general, they coincided.

There has been some obscurity in interpreting the

normal glucose tolerance test. In normal cases the greatest elevation of the hyperglycemia is from one-half to one hour after the ingestion of glucose. The blood sugar returned to normal in from two to three hours. In the mild cases the greatest elevation of hyperglycemia occurred from one to two hours after meals, and dropped back to normal in from three to four hours. In the moderately severe the hyperglycemia was variable, and the return to normal was at the end of a four or five-hour period. In the severe cases there was marked hyperglycemia during the whole five hours.

This short paper is of value in a practical way because it shows that a five-hour glucose tolerance test gives more information than the usual three-hour test.

The important conclusions derived from this study are as follows:

1. There is evidence that in a starving blood sugar of over 0.16 mg. the patient will not return to the normal blood sugar in five hours; in other words, it indicates a severe diabetes.

2. The blood sugar taken four hours after meals is a far better index of severity than the starving blood sugar. In general, a five-hour determination will give more information than the usual three-hour test. The duration of hyperglycemia, rather than the elevation, is of more clinical value.

RICHARD BARDON, M.D.

CARBOHYDRATE METABOLISM IN RELATION TO POSTOPERATIVE CRISES IN HYPERTHYROIDISM: Charles H. Frazier, M.D., Sc.D. (*Amer. Jour. of Med. Sci.*, Sept., 1931). The conclusions from this article are also of considerable practical value.

In exophthalmic goiter there is a decrease in the islands of Langerhans. This was reported in 1921 by Holst. Hyperthyroidism exhausts the glycogen store in the liver, and according to the author the liver seems to be the only source of blood sugar.

The rational treatment of crises following hyperthyroidism has to do with the use of intravenous glucose. A crisis may demand sugar over and above the available supply, and may precipitate a fatal hypoglycemia.

For some years glucose has been used in the postoperative treatment, but not very intelligently. Frequently it is given by rectum—a method now known to be totally ineffectual. It can be given by mouth, except that one cannot control the rate of absorption. When given intravenously, numerous precautions are necessary. It has been found out by Wilder, in 1917, that the normal individual can take care of .800 gm. of glucose per kilogram of body weight per hour when given intravenously, but the patient with hyperthyroidism develops glycosuria when as much as 0.6 gm. of glucose per kilogram of body weight per hour is injected. This would indicate faulty glucose assimilation.

The author recommends the administration of glucose solution but believes that it should not be given too rapidly or in too high a concentration. Usually a

5 to 10 per cent solution is the most satisfactory concentration, and the slow intravenous, continuous drop, has many advantages over the other methods, as it permits the addition of fluid at a rate at which the tissues, which normally take a part in the storage of water, can accommodate it. Just what causes these postoperative crises is, as yet, a matter of speculation. The author believes that glucose helps to tide the patient over a very critical period, and suggests that possibly the entire process is one of a disturbed carbohydrate metabolism, where the problem may be even more complicated.

There is considerable evidence from this paper that possibly the crises following thyroidectomy may be associated with hypoglycemia, although the whole mechanism is extremely obscure at this time.

RICHARD BARDON, M.D.

PEDIATRICS

THE EFFECTS OF SUSTAINED PITUITARY ANTIDIURESIS AND FORCED WATER DRINKING IN EPILEPTIC CHILDREN: A DIAGNOSTIC AND ETIOLOGIC STUDY: Irvine McQuarrie and D. B. Peeler (*Jour. Clinical Investigation*, 10:915, Oct. 20, 1931). The authors refer to work already reported on the relationship of water balance to the occurrence of convulsions in severely epileptic children, in which it was found that seizures, after having been brought under control by the production of a deficit in the body water, could be made to recur practically at will by the rapid reestablishment of a positive water balance with pituitary antidiuresis. The possibility of utilizing the observed reactions of the severe epileptic to an enforced positive water balance as a diagnostic procedure in mild or obscure cases occurred to the authors early in their studies.

The experimental subjects used in their present study consisted of three groups of children. The first was made up of patients who gave personal histories more or less typical of "idiopathic" epilepsy, but had seizures at infrequent intervals. The second included cases with indefinite histories of "fainting spells" or "sleepy spells," but no history of generalized convulsions or true petit mal. The third group consisted of essentially normal children. The food given included the ordinary mixed diet, and special diets comparatively low in NaCl. Two of the epileptic patients were kept on a basic diet, consisting exclusively of heavy cream, sugar and water, the purpose being to limit the mineral intake to an extremely low level, except for short periods when carefully weighed amounts of NaCl were added for a special purpose. While under observation a complete study was made of the water and mineral balances for each patient.

To produce a positive water balance, water was given at the rate of 2 to 5 c.c. per kilogram of body weight per hour at either three- or four-hour intervals, simultaneously with sufficient amount of antidiuretic extract from the posterior lobe of the hypophysis (either pituitrin or pitressin P.D.) to prevent water diuresis. As

a result of these studies the authors report that typical grand mal seizures can be induced within twelve to forty-eight hours in the epileptic, but not in the non-epileptic subject, by giving water at the rate of from 2 to 5 c.c. per kilogram of body weight per hour, while maintaining effective pituitary antidiuresis. This difference in response between epileptic and non-epileptic patients may be helpful in establishing the diagnosis early in an obscure case. Under the conditions of the experiments as described, dilution of the extracellular body fluids appears to be an essential factor in the induction of seizures since the administration of an amount of NaCl just sufficient to prevent this tends to interfere with their occurrence. The results presented lend strong support to the view that the mechanism for controlling semipermeability of the brain cell membrane is inherently defective in the epileptic patient.

C. A. STEWART.

THE POSTURAL TREATMENT FOR CEREBRAL HEMORRHAGE IN THE NEWBORN: Edwin A. Riesenfeld, M.D., New York, N. Y. (Arch. Ped., Vol. XLVII, No. 11, November, 1931). The presence of intracranial hemorrhage has been found as low as 10 per cent and as high as 60 per cent in all autopsies in stillborn infants and infants dying in the first few days of life. Among all the intracranial birth lesions, hemorrhages rank first as causing death.

The premature infant is particularly predisposed to intracranial lesions, due to the insufficient development of its tissues. When hemorrhage is extensive, usually associated with injury to the brain, the child is stillborn. In smaller hemorrhages, the child is stuporous. It cries with a peculiarly high pitched note. Respirations are irregular and feeble. Cyanosis, more or less constant, is observed. The infant nurses poorly or refuses to nurse at all. Convulsions occur frequently. In extensive hemorrhages, there may be bulging of the fontanel and separation of the sutures. A rise of temperature is often observed. The infant is usually pale. It appears as if in shock.

The generally accepted method of treatment has been confined to the administration of whole blood or blood serum, spinal tap, or the removal of blood or blood clot by entering the cranial vault. The last method is rarely resorted to today. Spinal tap, to relieve pressure and remove blood, is staunchly advocated by some, and as vehemently condemned by others. All new-born infants in whom the diagnosis of cerebral hemorrhage has been made should be placed in an upright position. The child should remain in the upright position for eight to ten days; or even longer should the symptoms of cerebral hemorrhage continue to manifest themselves.

Lessening in pressure readings in the cerebrospinal fluid in the upright position would tend to establish the rationale for the postural method of prophylaxis and treatment. In the upright position, the sagittal venous pressure is materially lessened as determined by

animal experimentation. This would seem to be the logical position in dealing with bleeding from a torn cranial vein.

R. N. ANDREWS, M.D.

APPENDICITIS IN INFANCY: Benjamin Lipshutz, M.D., Philadelphia (Arch. Ped., Vol. XLVIII, No. 10, October, 1931). The highest mortality of appendicitis is at the extremes of life, over the age of fifty and under the age of three. Appendicitis in the nursing is rare.

The importance of the early diagnosis of acute appendicitis in infancy is very great, since the infection tends to rapidly diffuse throughout the entire peritoneal cavity. The general effects are usually severe, and toxemia may reduce the patient to a dangerous state within 12 to 24 hours. The defensive reaction of the peritoneum in the young is characterized by an extraordinary rapidity of absorption. The encapsulation and isolation of a peritoneal infection with dense hard organized adhesions is rather a process of adult life. Once the infection has advanced to the stage of an acute diffuse peritonitis, the outlook for recovery becomes very grave. Of all abdominal surgical emergencies, at least 50 per cent result from appendicitis.

Every infant or child that complains of vomiting and exhibits evidence of abdominal pain should be considered as a possible case of appendicitis. The association of vomiting with diarrhea is the unusual in appendicitis. Vomiting and constipation are the cardinal symptoms of peritoneal irritation.

Acute abdominal symptoms may have their origin in some thoracic lesion. In doubtful cases a careful emergency X-ray of the chest will often disclose positive pulmonary findings before they are evident on physical examination. It is a matter of common knowledge that patients with throat infections or upper respiratory tract infections occasionally develop severe abdominal pain.

If, after a careful clinical survey of the patient, the diagnosis remains uncertain, it is a safe clinical bet that the odds of safety are clearly on the side of surgical intervention.

R. N. ANDREWS, M.D.

SURGERY

PHRENICECTOMY IN PULMONARY TUBERCULOSIS—INDICATIONS FOR THE OPERATION AND POST-OPERATIVE ACCIDENTS: Roger Pigeon (Revue de la tuberculose, 1931, XII, 842). The ideal indication is the fibrosing case in which pneumothorax cannot be used. The fibrosing tendency of such a lesion is shown in various ways: by clinical signs indicating the lack of any tendency to rapid progression, by well known X-ray signs, such as homogeneous shadows due to pleural thickening, diminution of intercostal spaces, unilateral deviation of the trachea, lack of mobility in the diaphragm when the

patient is made to breathe deeply, a scalloped diaphragm indicating adhesions, which prevent a satisfactory pneumothorax, finally the costophrenic angle obscured, retraction of the ribs, bronchiectasis, dextro- or sinistocardia. Some authors, however, consider complete pleural symphysis a contra-indication.

But not all cases showing a tendency to fibrosis are suitable for phrenicectomy. The typical case in which early and satisfactory results are obtained is the one characterized by a recent ulcero-fibrous lesion. In the presence of a lesion of this type the size of a hazelnut or up to the size of a walnut which has appeared without warning, the physician should not delay too long waiting for the spontaneous retrogression which rarely occurs; when a cavity the size of a mandrin has developed it is often too late. Even smaller cavities, if surrounded by organized fibrous walls, may prove refractory to the treatment. Again, it is necessary that the cavity be surrounded by more or less healthy tissue. It is foolish to expect results from phrenicectomy in extensive consolidated caseous areas such as are encountered in tuberculous pneumonemia, especially in the right upper lobe. Finally, the lesion should ordinarily be unilateral though small cicatrized lesions on the opposite side may be present.

In brief the principal indication for phrenicectomy is the presence of an ulcero-fibrous lesion with little tendency to rapid evolution and not secreting profusely. It may be at apex or base, on the right side or the left. It should be relatively recent, well localized, usually unilateral and not amenable to pneumothorax. The immobility secured is roughly proportional to the length of the portion of nerve removed.

Postoperative accidents.—The authors note the occurrence of headache, vomiting and tachycardia as of rather frequent occurrence though of not more than a day's duration, immediately following the operation. Spread of the lesion to the other side occurs in certain cases. In others with extensive though unilateral fibrous lesions, dyspnea has been considerably increased, especially if the elevation of the diaphragm has been considerable.

Hemoptysis has occasionally developed when not previously present. The writers have not observed gastric complications though other writers have reported them. Possibly certain abdominal symptoms may be due to change in intra-abdominal relations following the operation.

Cardiac complications have been reported by various writers but serious ones are rare. Naturally if a marked increase in the height of the diaphragm is secured, more work will be required of the heart and the operation should not be attempted in those whose hearts are already overtaxed. Bilateral phrenicectomy has been used by several physicians in the treatment of basal cavities but the writers do not seem to have had any experience with it and urge caution in its use.

Phrenicectomy may be used in association with pneumothorax, apicolysis or thoracoplasty. In pneumothorax it is indicated when adhesions at the base limit the completeness of the collapse. It is also of

value in certain cases of spontaneous pneumothorax. The use of pneumothorax on one side and phrenicectomy on the other side for a basal cavity is mentioned. The writers quote with some approval Wirth and Vonjaski, as recommending phrenicectomy before pneumothorax when a workman's time or resources are limited. They claim that the interval between refills may thus be lengthened. The use of phrenicectomy either before or during apicolysis and thoracoplasty is also approved.

A. T. LAIRD.

EFFECTS OF POSTURE AND THE DIAPHRAGM AND MEDIASTINUM WITH REFERENCE TO PHRENICECTOMY: Lincoln-Fisher (Amer. Rev. of Tuberc., XXIV, p. 57, July, 1931). In the first portion of the paper the author reviews the use of the recumbent postural positions in the treatment of tuberculosis. He describes the use of apparatus in the study of the effects of position on the diaphragm and mediastinum with the aid of the fluoroscope. He lists the different points from which the measurements are taken.

He states that when the lateral position is first assumed there is shown in the normal an initial increase in the excursion of the diaphragm which is most marked on the dependent side. After a period of thirty minutes to one hour this increased excursion is decreased somewhat, more so on the dependent side. The excursion of the diaphragm is more in the lateral recumbent posture than in the erect position.

Concomitant with the increased excursion is a rise of the diaphragm on the most dependent side. At the end of the hour there is a farther rise in the diaphragm of the dependent half, accompanied by a partial recovery and rise of the upper half. The dependent half of the diaphragm assumes a higher position and the upper half assumes a lower level in the lateral posture than with the patient standing erect. The heart and the mediastinum fall toward the dependent side, shifting as much as 5.3 cm. in one hour. The average shift was greater with the patient on the left side. After phrenicectomy these findings are accentuated. When the paralyzed half of the diaphragm is most dependent there is an increase in the elevation of the paralyzed half, and then the unparalyzed half of the diaphragm when uppermost assumes a lower level and has increased excursion. This persists to some extent while erect. The heart and mediastinum show a tendency to fall more to the paralyzed side. At times postoperatively the patient complains of trouble in breathing when lying on the good side.

The author then shows a number of tables of fluoroscope experiments to show his contentions in regard to the position of the diaphragm in the different positions.

In the summary the author states:

1. The diaphragmatic excursion is generally greater if the patient is in the lateral recumbent posture, decreasing somewhat before the end of an hour.

2. The lateral recumbent posture ascent of the de-

pendent and descent of the upper hemidiaphragm occurs initially, both halves assuming a somewhat higher level by the end of an hour.

3. The heart and mediastinal contents shift towards the dependent side, the average displacement being greater to the left than to the right.

4. Following phrenicectomy there is descent and increased excursion of the contralateral hemidiaphragm, which is accentuated and tends to persist in the lateral posture. The dependent half is forced still higher into the thorax by the pressure of the abdominal viscera.

5. Displacement of the heart and mediastinum due to posture is greater in phrenicectomy.

6. Increased respiratory labor following phrenicectomy requires a compensatory overaction of the contralateral hemidiaphragm forming the paralyzed half. This hyperactivity is less as the postoperative interval lengthens.

7. Posture rest on the better side following phrenicectomy is inadvisable.

8. The lateral recumbent posture increases diaphragmatic breathing, a change favoring rest of upper lobe lesions. Following phrenicectomy the scope of postural rest is widened, especially for patients with unilateral involvement or with only apical disease in the contralateral lung.

Since reading this article I have instituted the postural treatment in some of my cases of phrenicectomy. In those in which I have used this I have had the following complaints:

1. That when first used there is an increase in coughing and in the amount of sputum expectorated.

2. That after a time this subsides and the patients in general feel much better.

No remarkable results have been as yet shown.

J. J. ROUSE, M.D.

THE MENACE OF METHYL ALCOHOL

The dangers from the use of methyl alcohol have increased because the prohibition of alcoholic beverages has led to the substitution, in ignorance or unwittingly, of methyl alcohol. The danger has been increased by its use in automobiles as an anti-freezing agent in radiators of motor cars. In addition to the deliberate or the unsuspecting imbibition of the harmful methyl alcohol there are the dangers not only of inhalation of its vapors but also of its possible absorption through the skin. From studies on animals, it has been estimated that approximately 1 ounce of methyl alcohol repeatedly in contact with the human body, under conditions favorable to retention and evaporation, constitutes a threat to well-being. It has also been estimated on the basis of experiments on monkeys, that the vapors of one ounce of methyl alcohol entering the human body constitute a threat to life even when the exposure is distributed over two or three days. (JOUR. A. M. A., December 5, 1931, p. 1710.)

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

ELECTROTHERAPY AND THE ELEMENTS OF LIGHT THERAPY. Richard Kovacs, M.D. Clinical Professor and Director of Physical Therapy, Polyclinic Medical School and Hospital, New York, etc. 528 pages. Illus. Price, cloth, \$6.50. Philadelphia: Lea & Febiger, 1932.

PROCEEDINGS OF THE TWENTY-FIFTH ANNUAL CONVENTION OF THE ASSOCIATION OF LIFE INSURANCE PRESIDENTS. 278 pages. Illus. New York: The Assn. of Life Insurance Presidents, 1931.

ANNUAL REPORT OF THE SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE OF THE UNITED STATES. For fiscal year of 1931. 354 pages. Illus. Price, 85c, cloth. Washington: U. S. Government Printing Office.

COURTS AND DOCTORS. Lloyd Paul Stryker. General Counsel for the Medical Society of the State of New York. 236 pages. Price, cloth, \$2.00. New York: The MacMillan Company, 1932.

GENERAL SURGERY. The Practical Medicine Series. Edited by Evarts A. Graham, A.B., M.D. 804 pages. Illus. Price, cloth, \$3.00. Chicago: The Year Book Publishers, 1932.

GENERAL MEDICINE. Practical Medicine Series, 1931. Edited by George H. Weaver, M.D., et al. 814 pages. Illus. Price, \$3.00. Chicago: The Year Book Publishers.

PHYSICIANS' MANUAL OF BIRTH CONTROL. Antoinette F. Konikow, M.D. 245 pages. Illus. New York: Buchholz Publishing Co., 1931.

PRIMER ON FRACTURES. Coöperative Committee on Fractures, American Medical Association. 63 pages. Illus. Price, \$1.00. Chicago: American Medical Association Press, 1931.

FEMALE SEX HORMONOLOGY: A Review. By William P. Graves, A.B., M.D., F.A.C.S., Professor of Gynecology at Harvard Medical School. First Edition. Cloth. Price, \$3.50. Pp. 131, with illustrations. Philadelphia: W. B. Saunders Company, 1931.

A contemporary of Virchow or of Pasteur may have looked into the fields opened by those men and seen potentialities equal to those which, "with wild surmise," appear to modern physicians in the subject of female sex hormonology. The prospect is fascinating, rich and stimulating. The facts known are many, and conjecture and theory concerning them has greatly in-

creased the complexity of the situation. Attempts at reviewing the subject are numerous; this effort of Graves' is conspicuous among them by reason of its clearness. He achieves this clearness by his arrangement of material, by freedom from digression, and by a glossary which adequately defines and describes the terms of a rapidly growing, special vocabulary. In this glossary certain original investigations in hormonology are specially designated as historical landmarks, and will thus serve as guides to the reader in this field.

The book, as indicated by the author, was "originally undertaken to furnish a concrete picture of a complex subject" for his lectures. It is designed, as he says, for the student with little previous knowledge of the subject. It is this point which makes the book so valuable, for the student who may have had previous knowledge of the subject will almost certainly be more hopelessly lost than one who had none; the author indicates this—with another connotation, however—when he says that "as the game proceeds the pawns will necessarily be differently placed." An illustration of this idea is seen in the work of Hartman concerning menstruation, in which the previous conception of that process is completely changed from a passive to an active one, with a special pituitary hormone producing it independently of either the follicle-stimulating or the luteinizing principle.

There are twelve chapters: Early history; Sexual cycle in animals; Sex cycles in the ovary; Sex cycle of the human uterus and its correlation with that of the ovary; Search for the hormones of the ovary; Discovery of the hypophysis as an agent in the sexual and reproductive cycles; Hormones of the anterior lobe identified; New theories regarding menstruation; New theories regarding parturition; New theories regarding lactation; Organotherapy.

E. C. HARTLEY, M.D.

SIMPLE LESSONS IN HUMAN ANATOMY.

B. C. H. Harvey, M.D., Professor of Anatomy, University of Chicago, American Medical Association, 1931. Price, \$2.00.

This moderate sized inexpensive volume is a compilation, somewhat elaborated and with numerous illustrations added, of a series of articles by the author which appeared in *Hygeia*. The material was prepared for the lay reader and is presented in an interesting manner (a supposedly impossible task), the functions of the various parts of the body being correlated. The volume would be suitable for the high school curriculum.

C. B. DRAKE, M.D.

WANTED—Salaried appointments for Class A Physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

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FOR SALE—Office equipment including X-ray. Location in Minnesota town of 1,400 people. Average income of over \$5,000 yearly for the past eight years. Unopposed. Specializing. Address D-150, care MINNESOTA MEDICINE.

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PHYSICIAN WANTED—In northern Minnesota town, population six hundred. No competition, large territory. Equipped office of former physician can be rented. Write D-160 care MINNESOTA MEDICINE for information.

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